PLANNING EDUCATION FOR ACCELERATED NATIONAL DEVELOPMENT IN THIRD WORLD COUNTRIES : A CASE STUDY OF MALAWI

by

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ABSTRACT

The objectives of the research undertaken was to assess the role of education in stimulating 'accelerated development' in the poor countries, with particular reference being made to Malawi. The effectiveness of various educational planning models, when applied to manpower planning problems in Malawi were reviewed and evaluated.

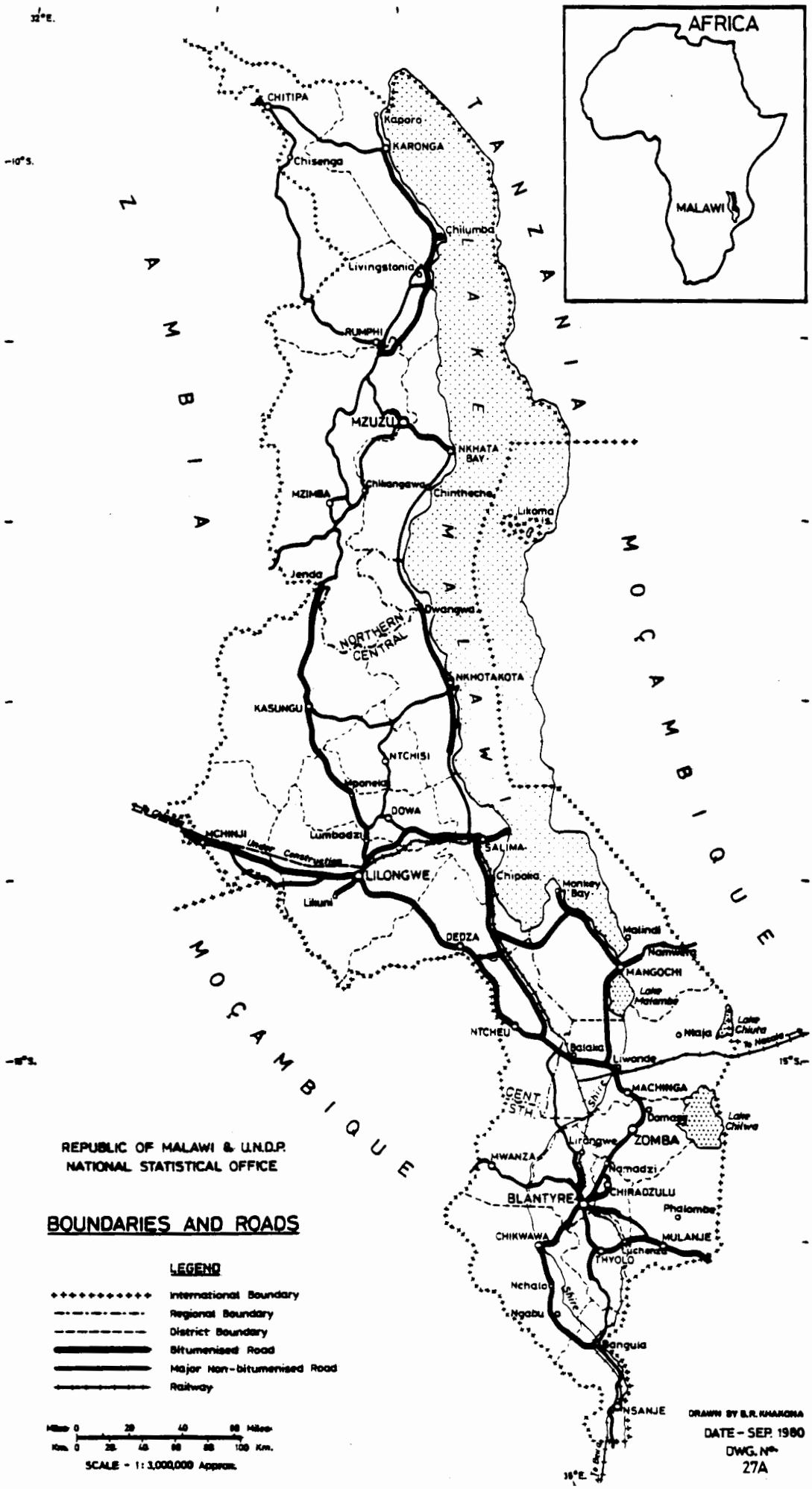
An assessment was made of early approaches to educational provision and manpower growth as evidenced in Conferences such as the Addis Ababa Conference (1961), the Ashby Report on Nigeria (1960), in addition to a reappraisal of educational planning measures which occurred in the 1970s.

The structure and provision of educational facilities in Malawi was reviewed in the light of the existing severe shortages of skilled and trained manpower being experienced by the nation. Such shortages of manpower have been found to pose considerable hindrances to the development process.

An assessment and review of the available educational planning frameworks was undertaken, with particular attention being given to the Manpower Planning Framework, this being the approach employed in Malawi to assess projected shortfalls and increasing demand for skilled manpower. The Thesis points to a number of limitations in the Manpower Planning approach as implemented in Malawi, and in view of such limitations, recommends the application of a Benefit Cost Analysis to educational planning, stressing the flexibility it permits in the planning process.

The Benefit Cost approach was applied, in illustration, to the problem of determining how to overcome the projected shortfalls in manpower requirements experienced in one occupational sector of the economy, notably the shortages which exist in the engineering sector. The statistics utilised in this illustration were derived primarily from the Malawi National Statistical Office, in addition to the findings of a series of A.I.D. Reports on the matter.

In conclusion, the Thesis pointed to the importance of co-ordinated long-term planning, and the adoption of educational planning frameworks. It was deduced that the differing educational planning aproaches, in particular the Manpower Planning Approach and the Benefit Cost Analysis Approach, are rightly complementary in their application, not competitive as is commonly assumed. Hence it is proposed that increased flexibility be built into the educational planning process.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MALAWI
32°E.
10°S.
15°S.
18°S.
CHITIPA
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Chisenga
Chilumba
Livingstonia
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MZUZU
NKHATA BAY
Chilangawa
Chinthecha
MZIMBA
Likoma Is.
Jenda
Mzuzu
NORTHERN
CENTRAL
NKHOTAKOTA
KASUNGU
NTCHISI
Mponela
DOWA
MCHINJI
Lumbadzi
SALIMA
LILONGWE
Chipoka
Monkey Bay
Lilongwe
DEDZA
Malindi
Namwera
MANGOCHI
Lake Malombe
NTCHEU
Balaka
Liwonde
Ntaja
Lake Chiuta
To Nacala
MACHINGA
CENTRAL
STH.
Shire
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Lake Chilwa
Lirangwe
ZOMBA
MWANZA
Ngmadzi
BLANTYRE
CHIRADZULU
Phalombe
CHIKWAWA
MULANJE
Luchenza
THYOLO
Nchalo
Shire
Ngabu
Bangula
NSANJE
To Beira
35°E.
ZAMBIA
TANZANIA
MOCAMBIQUE
MOCAMBIQUE
LAKE MALAWI
REPUBLIC OF MALAWI & U.N.D.P.
NATIONAL STATISTICAL OFFICE
BOUNDARIES AND ROADS
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CHAPTER 1

THE PROBLEMS OF DEVELOPMENT

1. THE PROBLEMS OF DEVELOPMENT

By the mid twentieth century approximately three-quarters of the world's population was living in poverty stricken and underdeveloped nations, while the other quarter lived in a situation of affluence and material progress. With the increasing need for co-operation between nations and concern with human rights, it became evident that if political and social upheaval was to be avoided a more equitable distribution of wealth and progress would have to be attained. The way to improving the situation of the underdeveloped and poor nations was seen to be through stimulating and increasing economic production by means of a planned program of accelerated development.

The optimism with which such proposals were viewed is evident in Harbison's (216:1975) assessment of the steps necessary to stimulate economic growth:

> The country which commits itself to accelerated growth will find that it is imperative to do certain things... It must increase sharply its rate of savings by one means or another. It must place emphasis on industrial development, but at the same time it must modernize and increase the productivity of agriculture. It must invest wisely both in real capital and in people. In so doing, it must develop a sense of priority and timing, so that savings and manpower are directed into the most productive channels. All of this requires integrated planning and co-ordination of effort.

Attempts to stimulate economic growth and 'development' in the Third World or Lesser Developed Countries in the early 1960s period, appeared initially to meet with a considerable degree of success; Gross National Products rose dramatically and elaborate and ambitious plans were formulated to bring about educational, rural and urban development in the following decades.

It became increasingly obvious in the early 1970s however, that the plans set during the previous decade had frequently been overly ambitious, while financial restrictions and external factors forced

the Lesser Developed Countries to modify the plans and curtail expansion in many areas. The 1970s marked a period then, of moderate economic growth and trade worldwide, accompanied by rising real energy prices with the 'oil crisis'. Naturally, the Third World countries were greatly influenced by this external environment, and in particular by energy shortages - their growth slowed considerably, giving rise to a widening gap between the so-called 'developed' countries and the middle income nations, but more especially between these countries and the low-income countries which recorded Gross National Products of less than US $370 per person. In fact, according to the World Bank Development Report of 1981, (10;1981), per capita growth rates in these low-income countries were more than halved during the 'seventies, falling from 1.8% in the 1960s to 0.8% in the 1970s.

One of the main external factors which gave rise to this declining growth rate has been seen to be the rising costs of oils and raw fuels. Naturally then, the Third World countries who are in the fortunate position of possessing oil reserves in their nations have been somewhat buffered against these external influences which have so restricted the growth in other Lesser Developed Countries, and in fact, the middle income oil exporters are reported to have shown a reasonable growth rate between 1960 and 1980, with manufacturing growth averaging 7.6% (World Bank Dev. Report 1981;16). As was mentioned, the growth in the low-income oil-importers was far below this level, and the serious situation was arising whereby population growth actually appeared to be increasing more rapidly than the growth recorded for the Gross National Product. Moreover, the low-income oil importers not infrequently possess little in the way of natural resources apart from agricultural land and surplus labour. A significant number of countries which fall into this situation are to be found in Asia, some scattered throughout South America, and more especially in Sub-Saharan Africa.

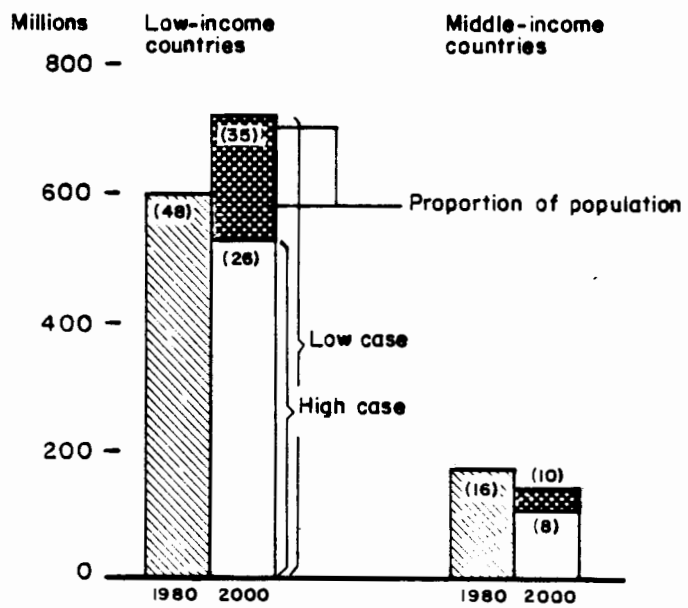
In line with the slowed growth rates recorded in these low-income countries in the past decade, current account deficits have climbed steadily, from an estimate of US $7 billion in 1972 to US $39 billion in 1975, rising to US $70 billion in 1980, which accounted for approximately 4.5% of their total GNP, as these nations were forced to rely

increasingly upon foreign income and external aid if they were to implement any programs of 'development' action.

The position of these low income countries is further emphasised by the large and increasing disparities between their national income and that of the industrialized countries in the 1980s. The World Bank Dev. Report (1981;16) states that during 1981 the income per person in the industrial countries was approximately five times that of the developing countries as a whole, and as much as twelve times that of the low income oil importers.

In view of such factors, it would seem that the prospects for bringing about positive economic growth and reducing poverty in these low-income countries are bleak, with 1980 estimates of approximately 750 million people, or 33% of the total population of the low-income countries living in 'absolute poverty'. (World Bank Dev. Report 1981;).

FIG. I.I: Numbers in absolute poverty, 1980 and 2000.



(Source: World development Report; 18; 1981)

In the light of the slow rate of economic growth and the prevailing conditions in these countries, it becomes necessary to determine what is actually meant by the term 'absolute poverty'. The term implies more than simply a slow growth rate of GNP or national income, but includes important social factors affected by the slow growth rate, such as the lack of adequate housing facilities, for instance, as well as poor health and nutrition among the population, a lack of educational opportunities and limited employment prospects. The actual extent of this 'absolute poverty' in the low income countries is difficult to determine, mainly due to the difficulties of data collection, but the situation is reflected in the World Bank Dev Report figures of 1980 (33) - In 1975, approximately 600 million adults in the LDCs were illiterate, while only two-fifths of the children in these countries had completed more than three years of primary education. By 1978, it was in turn estimated that some 550 million people lived in countries where the life expectancy rate was under 50 years, while 400 million people lived in countries where the average annual death rate of children aged 1 to 4 years was more than 20 per 1000 - about 20 times that of the industrialised countries.

Attempts of the past decades to counteract this situation of 'absolute poverty' which prevailed in the low income countries, focused primarily on stimulating growth in the economic sector with an emphasis on prime capital intensive projects. While there can be little dispute that an increase in GNP and general economic growth is desirable, it has become increasingly obvious that an increase in national wealth alone is insufficient to bring about 'balanced' development and deal with the social problems incurred during this growth process; migration to urban areas, illiteracy, inadequate health facilities; and rapid population growth, and a widening gap between the rich and the poor. Experience in the industrialised nations has pointed to the fact that the health, education and well-being of the population is as much a cause as a result of national prosperity. The recognition that a sick, unskilled and malnourished population can hardly make a positive contribution to the economic growth of a country has led to attempts to formulate more balanced developmental plans that do not bypass the majority of the population.

Attention has thus focused increasingly on the role played by human skills and productivity in generating economic growth in the low-income countries, and on the need to increase both the quantity and productivity of these skills needed to exploit the country's natural resources.

It is interesting to note in this regard, that the availability of natural resources within a country is not necessarily directly correlated with either the income levels or the recorded rate of growth. Many of the low-income countries in Sub-Saharan Africa, Zaire for instance, are blessed with abundant natural resources, but remain poor and record low growth rates, while the most rapidly growing economies such as South Korea, can exploit relatively few natural resources. It is important to recognise the fact then, that the link between economic growth and the availability of natural resources lies in the areas of developmental strategy adopted, along with the availability of financial resources and skilled manpower with which to exploit the resources.

This is not to underplay the importance of physical capital in the developmental process however. Much of the future successful growth of the low income economies will be largely dependent upon their ability to increase their domestic savings, and flow of foreign capital which they can then use in the restructuring of their economies. The basic infrastructure of the country, roads, irrigation systems, and communication networks, which are frequently the base on which economic growth depends, naturally also require considerable financial input. Experience reflects that developing countries which have invested a higher proportion of their output in physical capital, have by and large shown faster economic growth. Simultaneously, there is recognition of the need to reduce overall dependence on the export of one or two raw products, the reliance on the import of capital goods and dependence on imported fuels.

Such progress however, is clearly reliant upon the ready availability of technical, scientific and professional skills within the public and private sectors. It is postulated moreover, that fundamental skills and knowledge gained by the mass of the population through formal

education may also indirectly have positive consequences for economic growth. On the whole, it would appear that developing countries with higher literacy rates have evidenced more rapid economic growth, even after allowances have been made for differences in incomes and physical investment. Studies carried out by the World Bank (1980) support such attitudes, pointing to definite links between primary school education and the productivity of small-scale farmers, while it is believed that the immensely high growth rates of some countries such as South Korea are in large part due to the early mass literacy and numeracy of the country.

Table 1.1 Farmer Education and Farmer Productivity

Study	Estimated percentage increase in annual farm output due to four years of primary education rather than none
With complementary inputs	
Brazil (Garibaldi), 1970	18.4
Brazil (Resende), 1969	4.0
Brazil (Taquari), 1970	22.1
Brazil (Vicosa), 1969	9.3
Colombia (Chinchina), 1969	-0.8
Colombia (Espinal), 1969	24.4
Kenya, 1971-72	6.9
Malaysia, 1973	20.4
Nepal (wheat), 1968-69	20.4
South Korea, 1973	9.1
Average (unweighted)	13.2
Without complementary inputs	
Brazil (Candelaria), 1970	10.8
Brazil (Conceicao de Castelo), 1969	-3.6
Brazil (Guarani), 1970	6.0
Brazil (Paracatu), 1969	-7.2
Colombia (Malaga), 1969	12.4
Colombia (Moniquira), 1969	12.5
Greece, 1963	25.9
Average (unweighted)	8.1

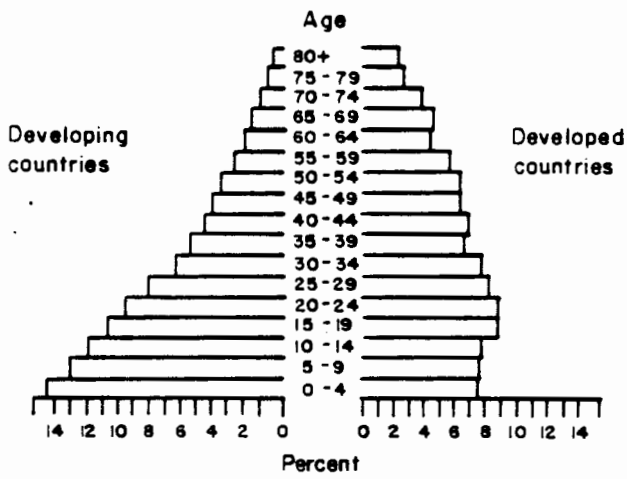
(Source: World Bank Development Report;48;1980)

However, while it is significant that the majority of the low-income countries, particularly in sub-Saharan Africa, reflect extremely low levels of literacy along with a great shortage of high and intermediate level manpower, one is unable to draw straight-line conclusions and assume that skilled manpower and formal education are in themselves the single most important factors contributing to 'development'. There are for instance countries such as Burma and Jamaica with high levels of literacy and life expectancy, but exceptionally low levels of growth, - around 1% per annum, - which tends to point to the fact that growth comes about as a result of a combination of interrelated factors - availability of natural resources, and financial capital along with skilled and equipped manpower.

What has been seen to have a profound influence on economic growth and development in the past few decades has been population size and relative population densities in the low-income countries. During the United Nation's Second Development Decade from 1970 - 1980 it was reported that the highest rate in the world population growth rate was expected - in the region of 2.0 to 2.1% (Jones;9;1975). In many low-income nations however, population growth rates exceeded this level, and of the 850 million which it was estimated would be added to the world population during this period, more than 705 million was population growth in the Lesser Developed Countries alone. In 1975 Jones; (10;1975) reported that population growth rates in the LDCs of Africa, Asia and South America were well over four times as high as those in Europe, the great proportion of the population being in the young and therefore non-productive age group. The 1980 World Bank Development Report (82;1980) in fact estimated that approximately two-fifths of the population in the LDCs were below 15 years of age, as opposed to the 'industrialised' countries where the ratio was in the region of one quarter, the comparison being evident in Figure 1.2.

Figure 1.2 Population Distribution by Age, 1980

FIG. I.2: Population distribution by age, 1980



a. Include industrialized countries, the USSR and Eastern countries.
(Source: World Development Report; 40; 1980)

(Source:World Development Report; 40;1980)

Table 1.2 Percentage of the School-going and Prospective School-going Age Groups in the Population of Major World Regions, 1970

	0-4 Age Group	5-14 Age Group	15-24 Age Group
World total	14	23	41
More developed countries	9	18	35
Less developed countries	16	25	41
Mainland East Asia	13	23	43
Other East Asia[a]	15	28	47
South Asia[b]	17	26	44
Africa	18	26	45
Latin America	16	26	45
Europe	9	16	32
U.S.S.R.	8	20	36
Northern America	9	20	38
Japan	9	15	36

Figures are according to the UN's medium projection.)

[a]Excluding Japan.

[b]Excluding Israel and Cyprus.

(Source: Jones; 12,1975)

The significant issue as regards this heavily skewed population distribution is that a relatively small portion of the population must be sufficiently productive in agricultural, manufacturing and technological fields to support the large dependent, unproductive sector which would require educational opportunities while making heavy demands on other basic areas such as health and food resources. In this regard, it was estimated in 1980 (World Bank Development Report 1981) that as much as 25% of the population of the typical LDC was of primary school-going age which required a significantly heavy investment on the part of the productive population. It has been argued that the earlier entry, and later withdrawal by the population from the workforce should help to offset this low ratio of workers to dependents, but this would in actual fact appear to have little significant impact, and the effect remains that the country is faced with heavy expenditure and investment on the school age population groups. The net result is frequently that the poorer country must decide either to have a lower enrolment rate at the schools and fewer social services per head of

population, or alternatively invest less on each individual in terms of education or basic social service. The long run consequences of such a position for the low income nations is of course a poorer, less educated and malnourished population which will have long-term consequences for the future exploitation of natural resources and economic development of the nation, a factor which has been becoming increasingly obvious from the outcomes of the United Nations Second Development Decade of 1970 to 1980.

> Human development depends on economic growth to provide the resources for expanding productive employment and basic services. In turn then, these services - primary and vocational education, primary health care, nutritional and family planning programs etc - can make striking contributions to growth ... Human development links the creation of productive work opportunities for the poor with the provision of goods and services to meet their essential needs. The elements of human development - health, education, nutrition and fertility reduction are closely interrelated. Improvements in one area can facilitate improvements in others and reinforce all aspects of development. (Source: World Bank Dev. Rep.97;1981).

The extremely rapid population expansion experienced in these low income countries, while being a serious impediment to accelerated national development is however, clearly not the only restricting factor on human development and economic growth. Budgetary pressure plays an important role, especially in view of the fact that the majority of human development programs in these low income countries are publicly funded. Largely unpredictable external pressures such as fluctuating world demand for exports and raw materials along with periods of severe fuel and oil shortages in the LDCs have frequently caused budgetary cut-backs, slowing investment in social programs and development projects. Such financial pressure has become increasingly severe in the 1980s with the 'oil crisis', forcing countries such as India, Turkey, Brazil and Malawi for example, to cut back on their development objectives, and more especially on investment in human development. The long-term consequences of cutbacks on programs to extend basic literacy or reduce fertility, for instance, are felt only a decade or so later, but are then likely to have a severe impact in the form of shortages of skills and heavy population demands.

However, due to the high recurrent costs involved in the provision of social programs, and the largely intangible nature of the "outcomes" of such investment, these are the areas most vulnerable to budgetary cuts, while the erroneous belief persists that investment primarily in physical capital is wholly justifiable.

While there exist no simple guidelines by which to allocate available resources between human development programs and physical capital projects in the LDCs, increasing attention is being given to this issue.

CHAPTER 2

DEVELOPMENT PLANNING AND PROGRAMMING IN MALAWI

2.1 THE MONETARY ECONOMY OF MALAWI AT THE TIME OF INDEPENDENCE

Malawi achieved its independence in July 1964, and was faced with a formidable task in attempting to stimulate development and growth within the country. In 1961 the Gross Domestic Product averaged a mere K40 per capita (Seltzer: 1965) while little attention had been paid to establishing any industrial or large-scale agricultural projects which would generate income and employment within the nation. Malawi was thus severely underdeveloped and ranked among the poorest nations in the world.

Malawi's prime natural resource was then, large tracts of fairly fertile land which gave rise to the dominant economic activity of subsistence agriculture, in which the vast majority of the population was engaged. What limited exchange sector did exist was essentially limited to the European and Asian population, with the result that the structure of the money sector at this time reflected significant racial aspects. Seltzer (1965) reports for instance, that of the members of the population earning a wage or salary, some 3900 Europeans averaged £1289 per annum (approximately K2191) whereas approximately 14 600 Africans had average earnings of only £60 (or K130) per annum. This unequal distribution of income in the salaried sector reflects indirectly, also the difference in occupational level held by the European and African sectors of the population, which in turn reflects educational and technological skill attainments. High and intermediate level manpower skills were thus to a large extent supplied by European immigrants. The indigenous Malawian population, having only had the opportunity of a very limited educational background, remained largely rooted in their subsistence agricultural activities, which however, frequently failed to provide sufficient monetary income. A sizeable proportion of this unskilled manpower was thus forced into a situation of migrant labour throughout Central and Southern Africa.

2.1.1. Migrant Labour and Malawi's Monetary Income

The number of migrant labourers in 1973 reached a peak when statistics revealed that there were some 123 000 Malawians employed in the South African mines alone. Naturally, the migrants' remittances to Malawi

became an increasingly important source of revenue to a country in dire need of foreign monetary income. The instability of such a source of funds became obvious in 1977 however, when South Africa employed only 17 000 Malawian contract workers. Remittances which are reported as having been approximately US $40 million or 31% of the export earnings in 1974, then fell dramatically to about US $9 million or 4% of export earnings in 1977. . (Action Memorandum 1980). The consequences of this cut-back in the migrant labour force did however have much more far-reaching consequences than even this fall in export earnings - it also meant that about 100 000 or more workers returning to Malawi would have to be reabsorbed into the domestic economy. Nonetheless, despite the instability and unreliability of monetary income from migrant earnings, this source of funds remains important in estimations of budgetary income and expenditure.

2.1.2 Private Sector Involvement in the Monetary Economy

Private sector involvement in the economy was exceptionally limited and such secondary activities and trading concerns as were in existence at the time of independence, remained on a small scale, and in foreign ownership. They thus gave rise to only a very limited cash generation and turnover, while failing to provide any opportunities for training of labour within the nation.

2.1.3 Imbalance in Malawi's Economic Development

The country's future development was to be further impeded by the lack of basic communication facilities within the country. Settlement by the Asian and European expatriates and colonists had been restricted to the southern area of the country with the result that the central and northern sectors of the nation had virtually no basic road infra-structure and the single rail line extended only in the southern region. Electricity and telephone services were all but absent apart from the three major towns in the south. In consequence, growth or development points were restricted to these towns, while the north and central areas of the country remained underdeveloped, evidencing extreme poverty.

2.2 THE NECESSITY FOR RATIONAL DEVELOPMENT PLANS

With the achievement of Independence in 1964 the new Malawian government under the leadership of Dr. Hastings Banda, turned to the task of counteracting the economically stagnant position which prevailed, with the implementation of a series of broad Development plans. Despite a considerable degree of progress and an average annual growth rate of the GDP of between 6.2 and 6.5% up to 1976 however, the situation remained severe, and by 1979 Malawi recorded a per capita GNP of US $180, a figure which placed it clearly on the United Nation's list of the world's 31 poorest nations. (Action Memorandum;8;1980). Furthermore, the actual severity of the situation is reflected in the fact that of the US $180 per capital GNP, it is estimated that only approximately $60 is in cash income.

This situation of economic poverty which existed, was further compounded by the absence of natural resources in the nation. Malawi's primary resources are essentially restricted to its labour supply (largely unskilled) and reasonably fertile lands, which amount to some 94 396 sq kilometres, on which more than 90% of the population of over 5 million subsist.

Unlike many of the surrounding states such as Zambia, Malawi does not have any mineral resources worth exploiting, which could have provided a financial basis for developments in other sectors. While it is recognized that such primary industries have generally given rise to serious problems of structural imbalance and a skewed distribution of income in almost all LDCs, it cannot be denied that they do provide capital resources which are badly required at this stage of the development process.

2.2.1 The Role of Government in Planning for Accelerated National Development

In a low-income country such as Malawi, which lacked natural resources and attracted few if any substantial commercial and manufacturing enterprises, it became necessary that the public sector intervene, and play a leading role in the economy and its general development. Such

participation in the case of Malawi, focused on the formulation of the Development Policies and planning programmes, and moreover, in the Public Sector Investment Programmes. Examination of the magnitude of public sector investment will show the extent to which the public sector has actually become involved in the economy. In the 1971-1980 'Statement of Development Policies' (109;1980) the plans indicate that the Government of Malawi intended to invest some K370 to K380 million over the decade in the economy, in order to achieve the development plans. Analysis of the main areas of expenditure and investment reveals then, which areas the Government gives priority to in the developmental scheme:-

- The lion's share of some K110 million of this investment was to be spent in the transport sector, with K60 million spent on roads.
- The next largest share of K70 million was allocated to agricultural expenditure, which was the sector of highest priority. Most of the K110 million investment in transport infrastructure was moreover, directly related to planned agricultural development in the underdeveloped central and northern regions of the country.
- Though the main expenditure in social services was on recurrent expenditure, there was an anticipated K55 million set aside to be spent on fixed assets over the decade. Education was allocated approximately K20 million, which included the costs of establishing facilities of a permanent nature for the University. Expenditures of K15 million for health and K20 million for housing were budgeted for.
- The Capital City Development Corporation, which had as its objective the planning and construction of a new capital city in the hitherto undeveloped northern sector of the nation,aimed to spend at a rate of K5 million per annum throughout the decade, totalling K50 million.
- Utilities such as power, water and sewerage were allocated some K40 million, two-thirds of which was to be used in the provision of power, particularly in investment in the establishment of H.E.P. stations.

- The remainder, apart from an allocation of K20 million for telecommunications was to be set aside for investment by the public sector in the commercial and industrial fields. Such intervention in the economy is undertaken primarily through the Malawi Development Corporation, a body established with the particular purpose of encouraging participation in the industrial and commerical spheres.

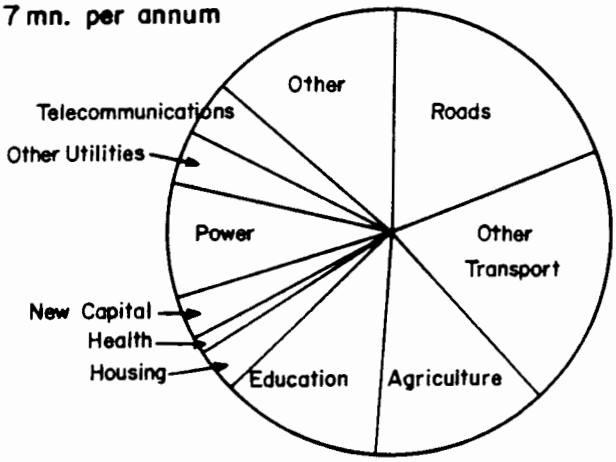
Thus, analysis of the major areas of government expenditure reveals that attempts to bring about accelerated development were focused primarily on the stimulation and rationalization of agricultural activities within the nation, with considerable emphasis on the development of the hitherto poverty stricken and neglected northern sector of the nation.

FIG. 2.1 : PUBLIC INVESTMENT

1964 - 1970

K 119 mn

Average K 17 mn. per annum



PUBLIC SECTOR INVESTMENT 1971 - 1980

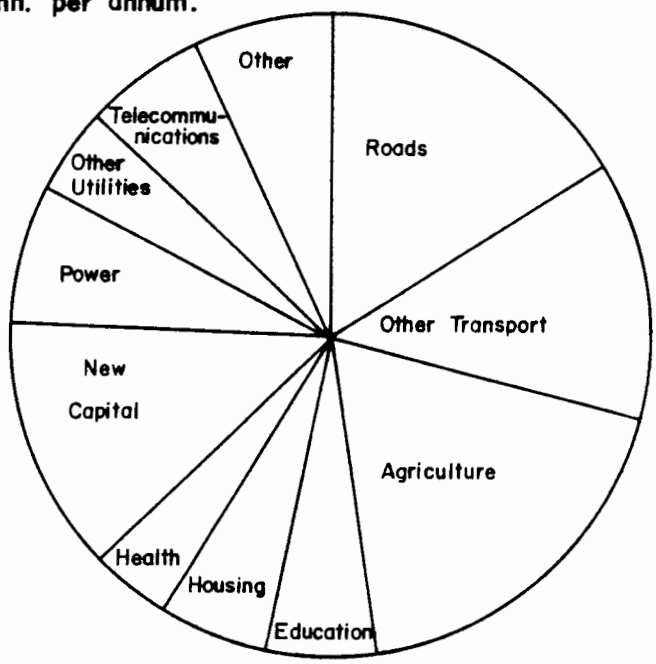
		K million
Transport		110
of which Roads	60	
Agriculture		72
Social Services		55
of which Education	20	
Housing*	20	
Health	15	
New Capital		50
Utilities		42
of which Power	28	
Telecommunications		20
Other		25
TOTAL		374

*Excluding project and C.C.D.C.

1971 - 1980

K 374 mn.

Average K 37.4 mn. per annum.



(Source : Statement of Dev. Policies , 112 ; 1970-80)

2.3 THE MALAWI DEVELOPMENT PRIORITIES - RURAL DEVELOPMENT AND AGRICULTURAL EXPANSION

The key issue in all the developmental proposals and plans then, according to the Public Sector Investment Program, has thus been a focus on rural development and agricultural production, which by 1980 was still the source of 45% of the country's total GNP. (Action Memorandum;8;1980).

As was stated in section 2.2 the vast majority of Malawi's population depends for its livelihood and basic subsistence on peasant farming. In the Statement of Development Policies (1971-80) it was reported that of an estimated 1.5 million economically active people in Malawi less than 150 000 were employed in the salaried sector of the population. This then meant that over one million workers were dependent on this peasant farming for their livelihood and income.

2.3.1 The Important Role of Peasant or Small-Scale Agricultural Farming Activities

The majority of the agricultural production is derived thus, not from large-scale intensive farming, but rather from small-scale farmers working on plots of land averaging 1.5 hectares per household. It is currently estimated that this form of agricultural production accounts for up to 85% of the total agricultural output. (Action Memorandum,8; 1980). Indeed, it has become increasingly clear that economic growth and development as a whole rests heavily upon the productivity and growth in this sector of the economy, and that any national development effort must focus on this area. The reliance on this sector is clearly shown in Table 2.1 of Projection of GDP by Industrial Origin below:

Table 2.1 Projections of GDP by Industrial Origin
(K million)

	Actual		Projected	
	1965	1970	1975	1980
(1) Smallholder Agriculture	92,8	114,4	146	191
(a) non-monetary	71,1	88,2	100	113
(b) monetary	21,7	26,2	46	78
(2) Estates and Government	6,4	14,5	22	28
(3) Total Agriculture (1) + (2)	99,2	123,9	168	219
(4) Other sectors	72,7	124,4	191	322
(5) TOTAL GDP at factor cost	171,9	253,3	259	541
(6) (3) as per cent of (5)	57,7	50,9	46,8	40,5

Source: (Kadzamira, 64, 1977)

With the above factors in mind, the Government of Malawi has adopted an agricultural development policy that focuses on developmental action in two main areas. One aspect of the policy focuses on irrigation and settlement schemes along the Moshov line, while the other aspect stresses the necessity of raising productivity levels on the small peasant farms, mainly by means of the teaching of new and improved agricultural techniques and through the extension of marketing operations and trade routes.

The 1971-80 Statement of Development Policies states, quite emphatically, that this emphasis on increasing the output of the small-scale farms is carried out not only with the intent of making the country self-sufficient in food supplies. The central idea is to encourage surplus production of specialised crops which may then be exported. Eventually it is anticipated that the high percentage of GNP (40%) comprised by subsistence crops will diminish. It is recognised though, that such measures will take several decades to fulfil, and in the foreseeable future subsistence production will remain an important source of income for most Malawians.

2.3.1.1 The National Rural Development Programme 1977

Recognition of the need to stimulate peasant crop production led the Malawi Government to establish the National Rural Development Program (NRDP) in 1977, which had the basic purpose of extending rural development projects and development opportunities. In the Action Memorandum (9;1980) the major objectives of this NRDP are outlined as follows:

- Increase the general level of Malawian small-holders' production. In particular, to increase the production of cash crops for export, and to feed the growing urban population.
- To provide infrastructure such as roads, storage facilities, markets, health facilities, schools, and clean water.
- To improve land, including consolidation and irrigation.
- To establish credit facilities for agricultural implements, fertilizers, seeds, insecticides and oxen.

- To provide inputs and services necessary to allow small-holder production increases, with particular emphasis on productivity per unit area.
- To preserve natural resources by encouraging high standards of crop husbandry, combined with soil conservation and the maintenance of forests through replanting of trees.

2.3.1.2 Factors Affecting the Success of Agricultural Development Schemes

However, the implementation of programmes and projects such as the NRDP scheme has not necessarily met with success, even in the early phases of input activity. To plan and prepare for such projects at the action-oriented level, a sufficiently highly qualified and skilled management force is vital, and this has been found to be seriously lacking in Malawi. The absence or shortage of the skilled personnel necessary to instruct the smallholder farmers and agriculturalists in conservation practice and in new techniques, has obviously meant that the programmes have not been implemented fully, resulting ultimately in adverse consequences for the national development plans.

2.3.1.2.1 Drought as a Factor Affecting Success in Agricultural Development Schemes

The successful implementation of Agricultural Development Schemes in Malawi has been seriously impeded since the end of 1978 when a drought first began to threaten the agricultural productivity of the Southern region, and thus the fundamental base for economic development of the nation at large. The drought continued into 1980 and it is reported by Legum (B697;1981) that agricultural output during this year increased by a mere 0.2%, as against a growth rate of 2.5% in 1979. Both these figures are below the 1978 rate. The crop most seriously affected by the drought was maize, this being the key crop of the subsistence sector, and the staple food crop for the country as a whole.

What advances had been made by the government in stimulating production of export crops on the small-scale peasant farms was effectively undone by the drought which did not favour their cultivation, in addition to

other compounding factors. Tobacco, for instance, which became the prime export crop with a boom period in 1977 when it accounted for an export value of K89.3 million and 55% of the total export value for the year, achieved a value of only K69.6 million in 1979. While the 1979 figure did represent an increase of 6% over the 1978 figures, a weakening of the price meant that the value rose only by 3%. (Legum B697;1981). The principal reason for the weakening of the price was the re-entry of Zimbabwe into the market. This has caused the Malawian government to begin urgently investigating the possibilities of diversification to other crops with export potential, most possibly groundnuts, which have shown a substantial growth in output, following the better prices offered by the government to the farmers for this crop. The production of other important cash crops, such as tea and seed cotton, reflect a rather similar position to that of tobacco. Production has remained static, being affected by the drought conditions, while world demand and prices have declined somewhat.

2.3.1.2.2 Shortages of Trained Agricultural Personnel as a Factor Affecting Success in Agricultural Development Schemes

With the present difficulties being experienced in the agricultural sector in Malawi and in view of the emphasis placed on the role of peasant farming in the development objectives, it becomes imperative that improved agricultural techniques and practices are made known to all sectors of the farming population.

The existing shortages of skilled and technologically trained personnel in the agricultural fields is evidenced in the vacancies reflected in Table 2.2. below:

Table 2.2: Estimated Shortages of Skilled and Technologically Trained Personnel in Agricultural Sectors

ISCO category	Occupation	Total	Malawians	Europeans	Vacancies
3	Agronomist	87	36	51	24
3	Veterinarian	15	3	12	2
4	Agronomic technician	158	136	22	42
4	Vet. Assistant	14	6	8	2
5	Agronomic assistants	1053	1053	0	80
5	Vet Assistants	415	415	0	37
7	Vet Assistants	195	195	0	13

(Data extracted from Manpower Survey 1971; Appendix A10;1980)

Such absences of skilled and technologically trained personnel in the agricultural fields, in the light of the current agricultural crisis in Malawi, take on more import and reflect a number of important factors. Firstly, it reflects on the current and past provision of educational facilities and institutions, which have clearly been inadequate to meet the growing demands for skills in these areas, while also indicating the importance of carefully integrated,flexible,co-ordinated planning procedures to meet such exigencies as they arise. But more importantly, these issues reflect on the availability of public finance for investment in such important areas.

2.3.1.2.3 Finance as an Agent in Successful Implementation of Agricultural Development Objectives

With the case of a low-income country such as Malawi, it is pertinent to enquire how the Government intends to raise the finance necessary to invest in development programmes, whether they be in the agricultural, social or industrial fields. It is also important to enquire as to how the country intends coping with any unforeseen consequences of its plans, and in the case of Malawi, how it copes with failures or shortcomings in sectors which provide the basic resources upon which development depends.

Typically, the poor nations which rely heavily upon subsistence agriculture to constitute a major portion of their total GNP, have relatively small amounts of money circulating in the internal economy and earn little foreign capital from their exports. Moreover, because of the exceptionally low per capita income, they tend to be characterized by a singularly weak tax base. The austerity of the situation is adequately revealed in the assessment of the taxation possibilities in the 1971 Development Plans:

> The level of real personal incomes in Malawi can be gauged from the figure of K60 average GDP per person in 1970, of which only K38 was cash income. With an estimated population of over 4½ million, total monetary GDP (factor cost) was only K152 million, plus a further K102 million in non-monetary income. This low level of income severely limited the tax revenues available to the Government of Malawi despite a rapid rise during the six years since Independence, from less than

> K10 million in 1964 to K30 million in 1970/71. Although the latter figure represented 17% of GDP, in 1970/1971 it was only K7 per head of population and therefore totally inadequate for providing the minimum level of services required, quite apart from the needs of the development programme. (Statement of Dev. Policies; 5;1971-80).

The possibilities of establishing a sound income tax base in the early years of the 1980s did not appear to be likely to meet with much more success than the earlier prospects. Despite an annual average growth rate in GNP per capita of around 6.2%, average personal income was still not much above K190. (Economic Report 1980).

In view of these factors, the fiscal policy of the Government of Malawi has focused on the minimization of the impact of direct taxation on the individual. It is also felt that low levels of personal tax will stimulate personal savings, even at the level of the peasant farmer, ultimately resulting in the nation establishing sounder financial reserves. Indirect taxation, stressing particularly import duties and tariffs, has served instead as a major source of revenue until fairly recently. Ironically enough however, the establishment of growth and manufacturing industries, frequently producing goods which have supplanted imports, has eroded this important source of revenue, causing unforeseen circumscription of finances.

Attempts to counteract this situation resulted in the introduction of the Surtax, which is essentially a sales tax placed on manufactured consumer goods, whether imported or produced locally. While the Surtax has resulted in a widening of the indirect tax base it is somewhat questionable as to whether the system is entirely just, in that it applies equally across all income brackets.

While the government continues to attempt to minimize the effects of a direct taxation system on the individual, direct taxation, in the form of an income tax, continues to yield important financial reserves from manufacturing organisations and individuals earning in the high income brackets. Naturally, as progress and economic development come about in the nation, direct taxation will become increasingly important, but it is recognised that a continuing, rapid increase in

such tax levels must be maintained within acceptable levels, if it is not to have adverse consequences in the long run. Shortages of financial reserves are currently overcome by reliance on available foreign aid, although reliance on such sources conflicts with Malawi's policy of 'self reliance'. Malawi has relied particularly on the Special Drawing Rights available to it from the International Monetary Fund, which allocated K2.1 million in 1979, and also upon finance amounting to US $40 billion in the Sixth Replenishment of IDA loans. (Economic Report 1980).

2.4 THE FUNDING OF DEVELOPMENT PROJECTS: MAJOR SOURCES OF FINANCE

The major sources of finances to the government are evident from Table 2.3.

Table 2.3 Malawi Government Revenue Account

K million
Constant prices adjust

Revenue	1971/2	1975/6	1980/1	Expenditure	1971/2	1975/6	1980/1
Taxation	33.3	55	94	Public Debt	5.2	9	20
Other revenue	3.5	5	8	Economic Services	6.4		
Grant-in-Aid	3.6	Nil	Nil	Social Services	11.4	51	82
				Administrative Services	17.4		
				Transfers to Dev. A/c.	Nil		
	40.4	60	102		40	60	102

(Statement of Dev. Policies; 117;1970-80)

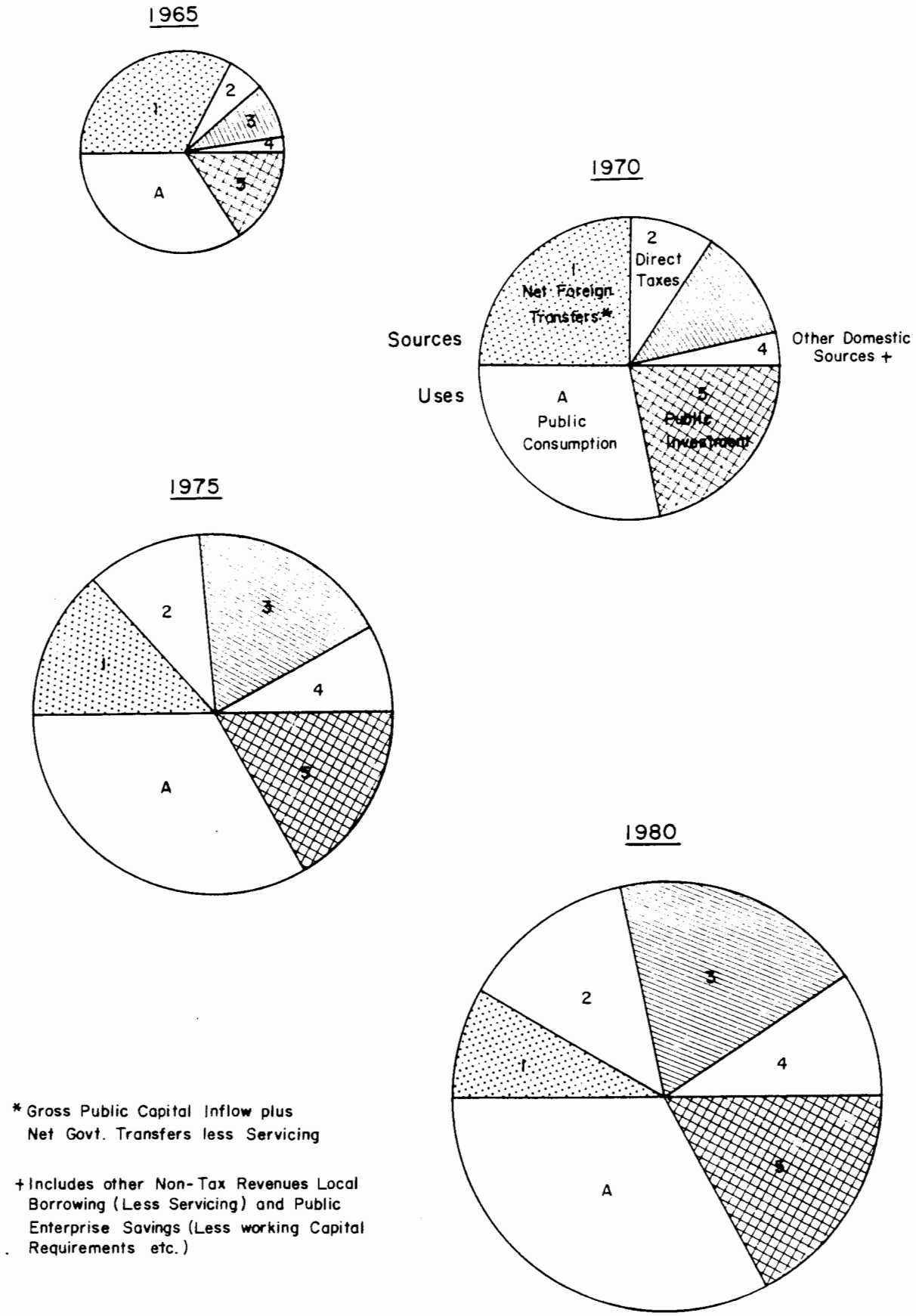
Considered in broad terms, finance is available from four main sources, apart from the taxation base: external borrowing, external grants, local borrowing and transfers from revenue accounts. (Statement of Dev. Policies 1971-80).

2.4.1.1 External Grants

External grants are certainly the most favourable source of funds, particularly in view of the fact that they require no debt servicing. As with most low-income countries however, Malawi receives only a small amount of its financial resources in this form. In the 1971

to 1980 period external grants accounted for approximately K10 million of expenditure and much of this was received through the Christian Church Organisations. It is reported though, that such funds are especially helpful in financing smaller projects, which because of their size or locality would not otherwise receive funding from external sources.

FIG. 2.2 PUBLIC SECTOR FINANCING



* Gross Public Capital Inflow plus Net Govt. Transfers less Servicing

\+ Includes other Non-Tax Revenues Local Borrowing (Less Servicing) and Public Enterprise Savings (Less working Capital Requirements etc.)

(Source: Statement of Dev. Policies, 118; 1970-80)

2.4.1.2 Local Borrowing

The extent to which the Government of Malawi can rely on financial resources from local borrowing tends also to be rather restricted. The reason for this, as is typical in most low-income countries, is the relatively low level of internal savings along with the need to maintain stability of such reserves, while also maintaining internal price levels. Moreover, excessive demand by the government on local reserves, should it give rise to a sizable drop in the country's financial reserves, would lead to a rise in the inflation rate. The government has therefore reportedly (Statement of Dev. Policies 1971-80) made every attempt to restrict borrowing from this source as far as is feasible. The Economic Report of 1980 supports this attitude, putting forward three principal reasons why it is essential that Malawi maintain these reserves:

> It is essential in an agriculturally based economy to be able to meet year to year fluctuations in export proceeds due to vagaries of both weather and international commodity markets. The reserves also provide the backing for Malawi's currency. Even more important, they maintain Malawi's credit-worthiness abroad. The latter objective is crucial if the external borrowing program is to be successful.

Consequently, internal borrowing has been restricted to approximately K5 million per annum, with a 12% increase per annum, based on the projected increase in internal savings of 15% per annum.

2.4.1.3 External Borrowing

Due to the limited availability of financial resources from external grants and local loan sources, Malawi is heavily reliant for its finances on external borrowing and transfers from the Revenue account as was evidenced in section 2.3.1.2.3. For the development plans covering the period from 1971 to 1980, the government relied on some K265 million to be met by external loans and transfers.

The extent to which Malawi is dependent on such foreign sources of finance is more graphically illustrated in Table 2.4 of the Malawi Government Development Account below:

Table 2.4 Malawi Government Development Account 1971-1980 (Summated)

Resources		Uses	K million
External Borrowing		Recurrent Expenditure	40
Transfers from Revenue Account	265	Direct Investment	225
Local Borrowing	90	Lending to Public Enterprises	100
External Grants	10		
	365		365

(Source: Statement of Development Policies;112;1971-1980)

The outcome of such a heavy reliance on external loans is, of course, the need to service the debt incurred through such borrowing. Malawi cannot rightly afford to borrow on hard terms, but fortunately has a number of soft term loans available, primarily from the Canadian government (interest free for 50 years, with 10 years' grace), the British and Danish Governments (interest free for 25 years, and 5 years' grace) and the IDA (3/4% service charge for 50 years with 10 years' grace). (Statement of Dev. Policies; 113;1971-80).

The soft term loans in fact total almost half of the required financial resources; the other half must be borrowed on hard terms, with payment of the full interest rate of over 10%. With this regard, it is interesting to note the projected burden such debt servicing will place on the Malawi economy - in 1975, interest payments amounted to some K11½ million and had reached K20 million by 1980, as compared with K5.8 million in 1970. As a percentage of exports of domestic goods and services then, total servicing has exhibited a rising trend, from 11.8% in 1970, to 13.7% in 1975, peaking at 15.9% in 1978, and then declining slightly to 14.6% in 1980. (Statement of Dev. Policies 1971-80). Such a high level of debt servicing will clearly have a restricting influence on expansion and development, particularly with regard to those projects involving high levels of capital expenditure. The effects of these stringent financial requirements though go further in that funds for the financing of recurrent expenditures tend to be even further curtailed. Recurrent expenditures tend to be incurred mainly in social development programmes, such as in the provision of

housing and education facilities, which have, as a result, frequently been the target of financial cut-backs. Restrictions on development programmes in these areas, have, as was mentioned in Chapter 1, significant long-term consequences for the attainment of overall development objectives.

2.4.2 The Assessment of Financial Trends and Prospects

Malawi is forced to operate within a rather severely restricted financial framework and consequently to limit development plans accordingly. Further restraints on expenditure have come about through the government's efforts, from the mid-seventies, to entirely eliminate existing recurrent budget deficits. These recurrent budgetary deficits were largely the result of reliance on current budgetary grants-in-aid during the early years of Independence, which were essential if the Government of Malawi was to be able to maintain a minimum level of administrative and social services. Attempts to reduce reliance on this source of funds have met with success, the required grant-in-aid declining from K11.9 million in 1965 to K4.2 million in 1970/71, while attempts are currently being made to eliminate reliance on this income entirely. (Economic Report 1980).

The attempts to cut reliance on grants-in-aid have however led to further severe restraints on all expenditures and have resulted in a substantial increase in the tax effort. In the light of the limited financial resources available, it is only realistic to presume that Malawi will be forced to continue relying heavily upon foreign capital to finance development both in the public and private sectors. Such factors have had most important consequences for all development plans - capital and recurrent expenditure has been restricted and developmental efforts have focused on maximising labour-intensive techniques - hence the heavy reliance and promotion of small-scale agricultural production and Moshov-style irrigation projects, and the restrictions on the import of capital intensive machinery for the industrial sector.

Regardless of how careful Malawi is in the formulation of her development plans, and the degree to which debt is limited, the country, like most Third World nations, is unable to foresee and plan for all

exigencies. The severe drought experienced in the normally highly productive Southern region in 1978-1980 thus had inexorable effects on financial reserves, lowering the already very modest living standards of many Malawians and giving rise to a steadily climbing inflation rate. Legum (B696;1981) reports that inflation had risen to a high of 16.6% by late 1979, and while employment at this time had grown by 8.9%, wages had failed to increase by more than 3.3%. The net result was that when taking inflation into account, the value of wages in real terms dropped by almost 10%.

2.5 INDUSTRIAL GROWTH AND DEVELOPMENT OBJECTIVES - THE LINKS WITH AGRICULTURAL OUTPUT

The restraint on development expenditure and the current problems in meeting projected agricultural output, will naturally have important consequences for development plans formulated in the manufacturing sector of Malawi's economy. According to the Statement of Development Policies for 1971-80, it was assumed that concomitant with the projected rising output in agricultural production, the natural result would be increasing opportunities for the establishment and growth of processing industries. In turn, any substantial increase in processing industries would result in rising incomes from the sale of the output, which it was hoped would open up the market for industries producing consumer goods and agricultural inputs. The growth of secondary industries is seen also to be of special importance, in view of its potential for increasing domestic incomes, and indeed, between Independence and 1970 is reported to have achieved a growth rate of over 20% per annum. (Statement of Dev. Policies 1971-1980).

2.5.1 The Role of Multinational Organisations

As is the case with the majority of LDCs., Malawi is faced with the fact that it must rely heavily upon foreign capital and multinational corporations to establish sorely needed industrial enterprises.which frequently however, have a tendency to utilize capital-intensive techniques, so failing to provide sufficient training and job opportunities for the local population, and achieving little towards the long-term elimination of poverty. Furthermore, these industries have a general tendency to produce items which force the closure of smaller

labour-intensive home industries. This is particularly so in the areas of brick makers, carpenters and the like, in which case the general effect is to actually depress the living standards and incomes of the people rather than lead to improvements in their situations. Similar experiences in many of the LDCs have resulted in the adoption of 'intermediate' and 'appropriate' technology principles in an attempt to counteract such a situation. For these reasons, Malawi in its development strategy and policies has severely curtailed the introduction of capital-intensive undertakings, unless they serve a quite vital function and there is little option in technology. These industries are subject to particularly stringent taxation measures. The objectives of such policy issues are clearly espoused in the Development Statement 1971-1980 (2;1980).

> A high level of protective tariffs (for these industries) would lead to a serious rise in the prices of basic consumer commodities, which would depress real incomes and, probably, reduce the supply of agricultural produce for export ... In the case of supply based industries processing raw materials, they are only encouraged if they are able to pay export parity prices for their primary inputs. In this way industrial development in Malawi can contribute to the fundamental economic objective and avoid the effect, noticeable in some other developing countries, of concentrating income in the towns at the expense of the rural areas.

2.5.2 Local Participation in the Commercial Sector

Malawi has tended to stress the importance of local participation in the commercial sector. As was stated, (section 2.1.2), in the early post-Independence years, the majority of the commercial and manufacturing sectors were owned and run by foreign organisations or individuals, either of British or Asian origin. In an attempt to combat the extent of this foreign ownership, the Government established the Malawi Development Corporation, whose prime intention is to encourage participation in the industrial and commercial sectors by Malawian-based public and private bodies. In view of the limited financial resources available to the government for such investment and expansion programmes and the shortage of suitable skilled and equipped personnel however, it is accepted that the country will have to continue relying upon fairly extensive foreign participation in the economy for some time to come.

Consequently, there has been little, if any, attempt by the government at outright 'take-over' of the foreign firms, banks, insurance companies, etc., and restrictions over the level of foreign control of these firms have remained lenient. The Government of Malawi has however, participated in a number of industrial and commercial concerns throughout the Malawi Development Corporation, which in some instances has funded and established new organisations to operate in competition with the existing foreign controlled enterprises. Further steps have been taken to encourage local participation in small-scale commercial undertakings in the rural areas through what has been termed "administrative action". (Statement of Dev. Policies 1971-80). Such 'administrative action' comprised the closure in 1977 of all Asian trading stores outside the four major urban areas. The plan was for Malawians to undertake the operation of these small-scale operations in the rural areas, but in most instances this failed due to a lack of experience in this direction, which was exacerbated by the low proportion of the rural population having more than three years of primary education. The failure of this move was recorded in the Economic Report, (48;1980) - "Any attempt at structural change must cause a temporary dislocation in services; this is especially noticeable at the retail level and it will be some time before Malawians are able to take full advantage of the commercial opportunities opened up to them."

2.6 EMPLOYMENT OPPORTUNITIES AND THE SCARCITY OF TRAINED MANPOWER

Despite the various setbacks and restrictions posed by shortages of finance and drought conditions, the pursual of development objectives has meant that Malawi has reported a most impressive growth rate in employment opportunities, these being estimated at up to 88% in the commercial sector and at 177% in the agricultural sector between the 1969 and 1977 period. (Action Memorandum 1980).

Much of this growth has been the direct result of the emphasis on the use of labour intensive methods, which is reflected in the elasticity of the labour force with regard to real output. While such a growth rate in the commercial sector is admirable, it is feared that with the additional burden being placed on rural agricultural land by the rapidly

expanding population, which is reported to be growing at 3.1% per annum, emphasis must increasingly be on the further expansion of this employment in the modern sector of the population. To date, however, due to the priority given by the Government to rural development, and in particular, the attention given to the small-holder farmer, urban migration of the population has not been a cause of social and political problems, as have been experienced in many of the surrounding nations, notably Zambia and Mozambique. With the rapidly increasing population however, it is certain that Malawi will be unable to maintain her population in the rural areas, and if the negative consequences of urban migration are to be avoided, it is vital that considerable emphasis be placed on the continuing rapid development of the modern sector.

The importance of such steps was becoming obvious as early as 1978. While it was recognised that Malawi had achieved a substantial economic growth of approximately 6.2% per annum to 1978, and had relied on labour intensive measures, it was increasingly evident that further growth in the manufacturing and commercial sectors was being impeded by a severe shortage of sufficiently highly skilled labour; as many as 75% of the high level management posts were occupied by expatriate personnel. In the early 1970s, official statistics reflect that as little as 10% of the economically active population were even wage earners. The vast majority of the population then depended upon subsistence production to meet their requirements.

2.7 THE ROLE OF EDUCATION IN COUNTERACTING PROBLEMS OF ECONOMIC GROWTH AND DEVELOPMENT

Many of the problems associated with the shortages of skilled and trained manpower, were the consequences of the failure of educational facilities to keep pace with the requirements of Malawi's growing productive sector. Thus, in order to prevent disequilibrium occurring in the development process, it had become necessary that Malawi allocate larger shares of the already strained budget to the provision of expanded educational facilities. This was a situation that had to be faced even in the light of the strain the drought situation was placing on the financial reserves of the country. It was recognised in the Action Memorandum of 1980 that this need for trained and skilled manpower resources had

reached a stage where it was critical to the overall success of the country's development plans.

2.7.1 The Financing of Educational Expansion

In an attempt to overcome manpower shortages, Malawi has approached bilateral and multilateral agencies and received considerable assistance from the World Bank in the financing of educational programs at primary, secondary and Teacher Training level. Other agencies such as the ODA (U.K.), the EEC and ADF are providing support for technical and higher education to help ease the manpower situation (Action Memorandum 1980), while the Malawi Government has encouraged the construction and establishment of self-help schools in the rural areas. The intake of agricultural colleges, technical schools and the University has been increased to meet the manpower needs, but it is recognised that the results of educational expansion are only to be seen in the long-term, and thus there will have to be a continued reliance on expatriate skilled personnel in the foreseeable future, which results in considerable expenditure to the country as such manpower is attracted to the country by internationally competitive salaries.

2.8 WAGE ADJUSTMENT AND BALANCED GROWTH

Such internationally competitive salaries and the recruitment of expatriate personnel, conflict with the Malawian Government's attempts to implement a stringent Wages and Incomes Policy in the country. Malawi has quite clearly pursued its development goals by stressing the importance of rising productivity in the sphere of small-scale agriculture, and it is on this base that any future increases in incomes in the country at large are thought to come about. In view of the fact then, that Malawi is primarily an agricultural country, and that the majority of exports are crops whose production accounts for over 25% of the total employment, any rise in wages which is not directly linked to increased productivity is assumed to "adversely affect estate agriculture and jeopardise the chances of attaining the projected levels of exports". (Statement of Development Policies; 3;1971-80). Thus wages are adjusted only in response to increased productivity while public investments have been focused on the transport and agricultural sectors, in an attempt to avoid alterations

which might increase the gap between incomes of rural and urban labourers.

In some nations the alternative approach has been implemented along the lines of the Keynesian model. It was assumed that increases in wages along humanitarian grounds would result in increased spending power and therefore widen the basic market for local industry, the net outcome being a demand-induced expansion of the economy. It is claimed however, by Gupta (1974) that such an approach did not lead to the assumed conclusion, and that in fact it led to the formation of a small privileged urban class and an overall heavy reliance on imports to meet the domestic demands.

2.8.1 The Wages and Salaries Policy - The Prevention of "Urban Bias"

In line with Malawi's development policies, every attempt has thus been made to prevent the development of a privileged group of urban wage earners, which would contrast strikingly with the rural population and be a stimulus to urban migration. Moreover, inflated incomes in the urban areas would necessarily give rise to an increase in the price of manufactured goods available thereby causing a reduction in the real incomes of the farmers and depressing the living standards of the mass of the population. The outcome of such a sequence of events would be a disincentive in the rural areas, which is the very basis upon which future economic growth is planned. Such policies are supported by a considerable amount of evidence from other African countries, among them Ghana and Togo, which have failed to implement a Wages and Incomes policy, with the result that rising wage rates actually led to a reduction in employment levels, the utilization of more capital intensive methods of production and a flow of job seekers from the rural areas to the cities, or neighbouring countries.

2.8.2 The Wages and Salaries Policy 1968 - The Stimulation of Economic Productivity and Trade

There are other persuasive reasons for Malawi's decision to implement a stringent Incomes Policy. One of the major reasons concerns the possibilities for the trade of manufactured goods on the international

market. In many instances the only feasible means of entry by an LDC into the world market, will rely on the ability to produce manufactured trade items more cheaply than the industrialised nations. If one analyses the situation more closely, it is evident that the manufacture of such products in most industrialised countries is reliant on a supply of agricultural and water resources and the use of capital equipment run by small numbers of skilled operators. The LDCs however, have neither the capital equipment resources available, nor the skilled manpower to operate such machines. In turn, production depends upon the availability of low cost raw materials and water resources, along with the cost of a larger force of unskilled labourers in the manufacturing field. It is only by keeping such cost factors at a low level that LDCs can hope to produce trade items at a cost below those produced in the industrialised nations. The situation in Malawi is adequately expressed by Gupta (389;1974) -

> A Wage restraintpolicy will ensure that any existing urban-rural earnings gap does not widen and increase migration at the expense of the development of the rural sector; it will also ensure lower costs in the manufacturing sector as compared with a high wage policy ... The objective of the Incomes Policy in Malawi is to ensure that wage pressures do not contribute to a rise in prices of domestically manufactured goods and thus to a fall in rural real income.

2.9 THE MANUFACTURING POLICY 1968 - THE STIMULATION OF ECONOMIC PRODUCTIVITY

In an attempt to pursue the objective of self-reliance, and further prevent any unnecessary dependency on imported goods, or the introduction of non-essential capital-intensive manufacturing techniques, what is termed the Manufacturing Policy was introduced simultaneously with the Incomes Policy in 1968. In line with the Incomes Policy, the object was to prevent the establishment of highly capital intensive industries, except where such technology is clearly vital to the country's well-being. Moreover, the tariff protection offered to such industries was severely limited in order to prevent in the long term, price rises on basic consumer commodities produced.

2.9.1 "Urban Bias" and Unbalanced Economic Development

Malawi was faced with a further problem in the pursuit of a policy of self-reliance and balanced developmentin that 'development' had tended to be unevenly distributed throughout the nation. Such economic development and establishment of manufacturing enterprises as had been undertaken before independence had centred primarily on the Central and Southern region of the country due to the access of the limited rail and road facilities as discussed in Section 2.1.3. The northern sector of the country had remained largely in a state of economic stagnation. Indeed, as early as the 1966 census, it was reported that 51% of the population inhabited the southern and central regions, while population densities here were as much as 3½ times as high as in the northern region. (Statement of Dev Policies 1971).

With the introduction of the Incomes Policy and Manufacturing Policy, a simultaneous attempt was made to spread economic and industrial development more evenly throughout the districts, thereby preventing migration of the population to the developed central region. Since 1970 tax incentives were introduced to businesses in the Lilongwe and Liwonde areas in the north, specifically with this purpose in mind. Plans were also formulated for the establishment of a New Capital city in Lilongwe, which is situated in the northern districts and surrounded by highly fertile agricultural land and which should prevent further migration of the population southwards.

These developments involving the New Capital however, are estimated to involve an annual expenditure of approximately K5 million per annum through the 1980s, and while such a growth point is undoubtedly necessary, the fact remains that investment of such magnitude in physical capital alone is somewhat questionable and not in line with the development policies as a whole. Indeed, it would appear in the later budgets that substantial cuts have had to be made in expenditure on social services in order to continue financing the project, as was reflected in Figure 2.1.

2.10 AN ASSESSMENT OF THE OUTCOMES OF THE INCOME AND MANUFACTURING POLICIES

The implementation of a stringent Income and Manufacturing policy has, nonetheless, according to statistics cited in Gupta (39;1974) resulted in significantly beneficial developments in the growth of employment and savings in Malawi at large. These statistics reveal that aggregate employment in Malawi actually declined in the late pre-independence period, from 163 100 in 1958 to 127 800 by 1964. Data for 1965 to 1967 is either unavailable or somewhat unreliable, but it would appear that it was a period of stagnation for employment levels. Gupta (1974) concludes on the basis of such information, that there were two primary reasons for such a decline in employment. In the first place there was a sizeable increase in the wage levels at this time, the effects of which pervaded all sectors of the economy, but with singularly adverse effects on the agricultural sectors. The second important reason was the stagnation in economic activity which prevailed in the early 1960s.

Coinciding with the introduction of the Incomes Policy and Manufacturing Policies, was a marked advancement in overall employment within the country along with rapid economic development and growth. While official statistics state that this growth averaged 6.2% per annum over this period (Budget Statement 1980) Gupta (1974) presents somewhat higher growth rates averaging 10% per annum over the period, and a recorded "high" of 14% in 1973. Despite such disparities in recorded growth, it is nevertheless evident that considerable 'development' did occur, the picture of overall employment in Malawi during this period being evidenced in Table 2.5 below:

Table 2.5 Total Employment in Malawi (A) 1954-1964 (B) 1968-1973 and Monetary and Total G.D.P. Coefficients of Employment

Year	Number	Percentage Rate of Growth of Employment*	Coefficient of Employment	
			Monetary G.D.P.	Total G.D.P.
1954	134,300			
1955	143,600	9.4	1.07	1.54
1956	159,000	10.8	1.05	1.26
1957	162,500	2.2	0.17	0.43
1958	163,100	.6	0.09	0.09
1959	161,200	-1.2	0.20	-0.26
1960	157,200	-2.5	0.26	-0.46
1961	152,100	-3.4	1.89	-0.81
1962	141,200	-7.7	1.22	-1.97
1963	135,600	-4.1	2.28	-1.11
1964	127,800	-6.1	1.69	61.00
....				
1968	134,472			
1969	146,500	8.6	0.61	0.92
1970	159,342	8.8	0.70	0.83
1971	172,281	8.1	0.28	0.37
1972	189,553	10.0	0.61	0.88
1973*	216,591	14.3	0.99	0.93

SOURCE: (a) Compendium of Statistics for Malawi 1970 Table 7.1
(b) Economic Report 1972, Table 8.1
(c) Economic Report, 1974 Table 8.1
* Estimated.

Source: (Gupta,40,1974)

Such growth in the economy was reflected up until 1978 in the establishment of a number of secondary manufacturing enterprises and import substitution industries which had been favoured to some extent by tariff protection measures. Gupta (1974) cites considerable evidence to support this development in the domestic market - the average rate of inflation during the period from 1964 to 1973 was just over 5% per annum, with GDP growth at factor cost of between 6-7% per annum and an increase in overall per capita income of between 3.4 to 4.5% over the same period. Naturally, along with the establishment of such import-substitution industries a change was recorded in the composition of Malawi's imports - in 1965 imports of goods for final consumption amounted to 50% of total imports, but by 1973, this percentage had dropped to 28%. (Gupta:1974). The rapid development in the manufacturing field is further reflected in the

following statistics:- Whereas in 1964 manufactured tea and tobacco processing together accounted for 46.2% of total net manufacturing output, by 1971 its share had dropped to 17.5%. During the same period the share of export industries as a whole declined from 50.4% to 21%. Against this, there was a rise in the share of both manufactured consumer goods from 40.1% to 58.8%, and of intermediate goods from 9.5% to 20.2%. The share of food manufactures and textiles rose sharply from 3.9% to 16.9% and from 1.5% to 11.7% respectively. (Legum, 1979).

The Government of Malawi further supported this growth through the development of a number of public bodies to assist in the planning, implementation and control of development policies. These institutions, which included the Malawi Development Corporation, the Investment and Development Bank of Malawi Ltd. and the Agricultural Development and Marketing Corporation (ADMARC) have as their primary purpose the co-ordination, funding and purchasing of crops cultivated on the small-scale, labour intensive farms, and arranging for the distribution of produce to domestic manufacturing organisations, in line with the National Rural Development Programme (Section 2.3.1.1)

2.11 FACTORS AFFECTING THE ATTAINMENT OF FUTURE DEVELOPMENT PLANS

2.11.1 Agricultural Productivity

Despite such progress in the 1970s however, the drought (Section 2.3.1.2.1) which began in 1978 continued into the 1980s having extremely severe repercussions on agricultural production across most regions of the nation. Although agricultural production increased slightly in 1979, the value of exports originating from this sector actually declined. In the 1980 Budget Statement (p.4) the Minister of Finance reported an "increase in total exports to a record high in 1979 of K190 million. On the other hand, even though the increase in the value of imports was 15%, this increase raised the balance of trade deficit from K127.1 million in 1978 to K138 million in 1979, because total imports rose from K285.2 million in 1978 to K328 million in 1979" as revealed in Tables 2.6 and 2.7 overleaf. Thus, any price gains obtained from the increases in the export of crops such as tobacco, sugar and groundnuts failed to compensate for this loss.

Table 2.6

MALAWI - DIRECTION OF TRADE (K'000)

	DOMESTIC EXPORTS TO						IMPORTS FROM					
	1974	1975	1976	1977	1978	1979	1974	1975	1976	1977	1978	1979*
United Kingdom	32,551 (36)	42,266 (40)	66,627 (47)	76,988 (45)	69,823 (46)	86,355 (45)	36,406 (23)	52,913 (24)	42,367 (22)	39,376 (19)	57,095 (20)	56,507 (17)
South Africa	3,661 (4)	5,604 (5)	7,300 (5)	12,412 (7)	6,808 (5)	7,271 (4)	36,536 (23)	52,787 (24)	55,202 (29)	77,824 (37)	108,702 (38)	134,068 (41)
U.S.A.	8,620 (9)	8,588 (8)	18,459 (13)	16,496 (9)	9,364 (6)	15,776 (8)	4,811 (3)	7,632 (3)	6,441 (3)	10,468 (5)	13,073 (5)	10,731 (3)
Netherlands	7,644 (8)	7,612 (7)	9,197 (7)	15,129 (8)	13,371 (9)	15,918 (8)	3,018 (2)	4,763 (2)	8,330 (4)	7,886 (4)	5,624 (2)	4,483 (1)
West Germany	1,417 (1)	4,275 (4)	4,634 (3)	8,387 (5)	9,822 (7)	16,394 (9)	7,162 (5)	8,654 (4)	6,980 (4)	8,145 (4)	9,310 (3)	16,572 (5)
Zambia	3,984 (4)	3,535 (3)	3,301 (2)	4,468 (3)	4,721 (3)	4,985 (3)	4,990 (3)	4,638 (2)	5,028 (3)	2,394 (1)	2,093 (1)	8,558 (3)
Rhodesia	7,202 (8)	7,436 (7)	3,001 (2)	2,141 (1)	1,317 (*)	1,198 (1)	20,096 (13)	25,733 (12)	9,264 (5)	5,678 (3)	5,966 (2)	4,618 (1)
Japan	818 (*)	1,033 (1)	1,643 (1)	2,054 (1)	2,345 (2)	2,200 (1)	8,586 (5)	16,516 (8)	14,451 (8)	18,386 (9)	28,855 (10)	31,513 (10)
Others	23,647 (30)	25,934 (25)	26,869 (20)	33,895 (21)	33,888 (22)	39,903 (21)	35,921 (23)	45,027 (21)	40,406 (22)	39,630 (18)	53,457 (19)	60,950 (19)
TOTAL	89,534 (100)	106,283 (100)	141,031 (100)	171,970 (100)	150,624 (100)	190,000 (100)	157,726 (100)	218,663 (100)	188,469 (100)	209,787 (100)	284,175 (100)	328,000 (100)

* Estimate.
Figures in brackets are percentage shares.
(*) Within brackets means insignificant.

(Source: Economic Report; 17; 1980).

Table 2.7

MALAWI'S IMPORTS BY END-USE

(K'000)

	1975	1976	1977	1978	1979*	% Change 1979 on 1978
Consumer goods	30,477 (14)	22,382 (12)	28,799 (14)	35,891 (13)	48,282 (15)	34.5
Plant, machinery and equipment	27,324 (12)	28,495 (15)	34,745 (16)	58,899 (21)	46,092 (14)	-21.7
Transport means	34,970 (16)	26,212 (14)	22,758 (11)	38,579 (14)	41,739 (13)	8.2
Materials for building and construction	16,992 (8)	19,546 (10)	16,512 (8)	23,662 (8)	27,008 (8)	14.1
Basic and auxiliary materials for industry	72,460 (33)	54,938 (29)	62,129 (30)	74,702 (26)	90,298 (28)	20.9
Parts, Tools and Maintenance appliances	7,188 (3)	7,060 (4)	10,419 (5)	13,976 (5)	13,231 (4)	- 5.3
Commodities for intermediate and final consumption	28,186 (13)	29,043 (15)	33,654 (16)	38,183 (13)	60,269 (18)	57.8
Miscellaneous and other transactions	1,066 (1)	804 (1)	771 (*)	1,283 (*)	1,081 (*)	17.7
TOTAL	218,663	188,480	209,787	285,175	328,000	15.0

* Estimate
Figures in brackets are percentage shares.
(*) Within brackets means insignificant.

(Source: Econ Report 15; 1980).

2.11.2 Productivity in the Manufacturing Sector

The economic situation is further assessed by Legum (B697;1981) who states that the outputs of manufacturing in the country grew by a mere 2.9% in 1980, as a result of increased manufacturing costs and lower sales. Building and construction output slowed from 4.6% in 1979 to 1.7% in 1980, and while major road and rail projects were completed in 1979, badly needed new communication and transport routes were not begun. The Index of Manufacturing Output Table (2.6) below reflects the declining percentage change in the manufacturing industries.

Table 2.8 Index of Manufacturing Output in Malawi

	Year			Percentage Changes		
	1977	1978	1979*	1977 on 1976	1978 on 1977	1979 on 1978
(a) Domestic Market Industries						
1. Consumer Goods:						
Food, beverages and tobacco	259.9	274.4	275.1	+ 8.9	+ 5.6	+ 0.3
Footwear,clothing & textiles	126.2	148.2	192.8	+14.8	+17.4	+30.1
Other goods	190.2	235.8	223.5	+ 7.6	+24.0	- 5.2
TOTAL CONSUMER GOODS	212.8	236.2	244.5	+ 9.4	+11.0	+ 3.5
2. Intermediate goods[1]	142.9	166.8	179.2	+11.1	+16.7	+ 7.4
Total domestic market industries	197.1	220.6	229.8	+ 9.6	+11.9	+ 4.2
(b) Export Industries	207.3	217.1	218.4	+20.3	+ 4.8	+ 0.6
TOTAL MANUFACTURING INDUSTRIES	199.1	220.8	227.5	+11.7	+10.9	+ 3.0

* Estimate (Source: Economic Report; 41;1980)

2.11.3 Inflationary Features

Rising inflation has also been experienced in the last 5 years in line with worsening world economic conditions, and the setbacks to Malawi's development plans. One of the more serious outcomes of this inflation which is reported by Legum(1981) to have reached 16.5% in 1980, is the decline in the real value of the wages and incomes received in both the agricultural and industrial sectors, resulting in lowered standards of living for an already poor population. Legum (1981) reports rumours of underlying discontent among the population, as a result of economic conditions, but states that "so tight is the control of the Life President, Dr Banda, that it finds little public ventilation." (Legum, B693;1981). Indeed, the President has maintained a remarkable degree of control over the economy and the public at large, managing to contain public discontent and opposition in the light of the worsening economic climate. Even if the drought currently being experienced, should ease, Malawi is now faced with inflationary conditions outside its control, which are likely to cause further complications to the development policies.

2.11.4 International Relations and Trade Agreements

The independence of Zimbabwe and its re-emergence into the field of international trade has had some important repercussions on Malawi's abilities to pursue its development objectives. Malawi now faces serious competition in the world market with its prime agricultural export products of tobacco, tea and sugar. In fact, it has already been recognised that the prime crop of tobacco can no longer be relied upon as an export bringing in high levels of foreign capital, as was discussed previously. This is not to say, however, that there are no benefits arising to Malawi out of the situation, such as new market potentials in Zimbabwe. However, the negative influences tend to outweigh the positive effects.

Zimbabwe's independence has, moreover, some important political consequences for Malawi. Malawi has, until the present, relied heavily on South Africa as a source of financial loans to implement development plans, and more particularly to construct the New Capital in Lilongwe.

However, being land-locked, Malawi is dependent on its neighbouring states for trade routes, and is expected to come under increased pressure from Zimbabwe and Mozambique to give up these controversial relations with South Africa. The result would be a serious decline in available funds for development programs in Malawi.

2.11.5 The Oil Crisis

Linked with the political issues associated with the availability of trade routes, has been the fact that Malawi, an oil importer, having no exploitable raw fuel reserves within the country, is compelled to rely heavily on her trade routes for the import of oils, fuels and lubricants. The situation became increasingly severe in 1980 when political opposition, based in Mozambique, continually destroyed rail links to the country. The Minister of Finance in his 1980 Budget Statement, spoke of the "very hazardous effects of the oil crisis afflicting the development of the economy... Not only did Malawi suffer from the astronomical increase in the price of oils and fuels, but even more disconcerting was the disruption in the traditional trade routes, which created a situation of great scarcity of these products in Malawi." (Budget Statement;4;1980).

In 1980, the situation became so critical that the country was forced to airfreight fuel into the country at great expense. Legum (1981) reports that the import bill for January 1980 alone amounted to K35 million, an amount which Malawi can ill-afford to divert from its development priorities. As with all low-income oil-importing nations, the escalating costs of fuel have served as extreme restraints on development projects.

It is reported in this regard, that real output in the non-oil producing developing countries as a whole, decelerated in 1979 to an average figure of a little over 4.5% as compared to 5.2% in 1978. (World Bank Report, 1980).

The Economic Report of 1980 (2;1980) reports that:

> The pattern of World trade and payments in 1979 was greatly altered by the upswing of oil prices. The current account balance of OPEC rose from a surplus of US $6 billion in 1978 to as much as US $68.0 billion in 1979. Naturally, the current account position of the industrial and developing countries swung sharply in the opposite direction, with the non-oil developing countries group bearing the bulk of the deficits.

2.11.6 The Shortage of Resources for Social Service Expenditure

The situation in Malawi itself became so severe due to the oil and trade disruption, that 'ripple effects' have occurred in every sector of the economy - manufacturing and agricultural activities are directly affected, while social services have suffered reduced budgets in order that the government might supplement new grants and loans which have been incurred. (Figure 2.1).

Even before the onset of the drought in 1978 and the fuel crisis, Malawi found itself "capable of providing only the most rudimentary facilities in the social services, especially in the health fields." (Economic Report 1980;48). In fact, according to the World Bank Development Report of 1980, Malawi has, until the present time, financed all its expenditures on health directly through grants and, to a lesser extent, loans, while expenditure on the provision of housing and education facilities has consumed a relatively minor portion of the budget. The attitude held in Malawi (as discussed in Section 2.3.1.2.3) is that financial independence above all is the major target, with the result that other development objectives specifically in the social services fields, must be necessarily restricted. (Statement of Development Policies 1971). Development policies regarding these areas have tended to stress primarily the provision of those health and education facilities which are likely to have a direct bearing on the increased productivity of labour. "The education policy is designed to bring about a steady increase in the number of Malawians qualified to perform executive, technical and administrative and professional functions, in both the public and private sectors, thus leading to the eventual elimination of the present reliance on expatriate personnel. (Section 2.5.2 & 2.6). (Statement of Dev Policies;5;1971). While such a development strategy

has undoubtedly been formulated on the basis of limited financial resources, there are indications that perhaps expenditure has not been sufficiently high in the past. As was discussed (Section 2.6) Malawi has currently been experiencing a severe shortage of locally trained personnel in the commercial and industrial sectors and has therefore been forced to rely on expatriate personnel at considerable expense to the nation. This shortage of high and intermediate level manpower as will be expanded upon later, has important all-pervading consequences for development programs within the country. Agricultural schemes, the introduction and operation of commercial and manufacturing firms, and the pursuit of social objectives and aims are also dependent to a large extent on skilled manpower for their success, and in any development attempt this factor should be borne in mind. Forward planning and expenditure in this direction warrants particular attention, simply in view of the fact that the training of such personnel, not infrequently, requires in all 15 to 20 years. It becomes evident then, that planning for development must encompass all aspects of the economic, manufacturing and commercial activities along with the social services of health, housing and education.

2.11.7 Population Expansion

An aspect of planning which has received almost no attention in Malawi, and which is beginning to greatly affect the economic growth and future development of the economy, is that of population planning and control. It is typical of most of the low-income oil importing nations, that while they have a great scarcity of natural resources and an economy that lacks secondary industry and commerce, they are also faced with a burgeoning population which places a heavy demand upon what limited resources do exist. Malawi is certainly no exception to the rule, and in fact has a population growth rate well above the average recorded in the low-income countries. In a report in the Zimbabwe Herald (6;1982) it was reported that between 1950 and 1975, the population grew from 2.7 million to 5.3 million, a growth of 94%. This trend continued and the estimated population in 1979 (Legum 1980) was 5.8 million. This represents, on average, an annual growth rate of 2.9% to 3%, which means that at the current rate the population should double in the next two decades. The dangers involved in such a state of overpopulation are

rather evident - like most other LDCs, it implies the sharing of very limited resources among the large and growing population. Even more serious is the way in which this distribution is skewed towards the youth - in Malawi, estimates reveal that approximately 47% of the population are under 15 years of age, meaning that for every one hundred adults there are about 94 children. Moreover, 3.8 million Malawians are either women in their productive years or children under 5 years. (Zimbabwe Herald 1982).

In the past, little attention has been given by the Government of Malawi to this rapidly growing population, possibly because attempts at the introduction of family planning would clash with the social and cultural norms of the people and give rise to political discontent and opposition. The government has thus procrastinated over this issue, relying on the past abundance of fairly fertile land resources. However, the situation has now arisen where this issue can no longer be reasonably set aside. Indeed, the rapid population increase is threatening even Malawi's primary development objective of self-sufficiency in foodstuffs and financial independence.

The increasing demand for food has resulted in the tilling of new, less fertile land and the fallow periods of the better agricultural land have been seriously foreshortened. Moreover, deforestation has occurred at a tremendous rate in the past decade with the rising demand for fuel wood. The net result of such activities has been a growing problem of erosion, which the uneducated peasant farmers are unable to combat.

In line with the growing demand for foodstuffs, exports of crops such as maize and cassava, once quite considerable, are now negligible. Exports of peas and beans also seem to be diminishing. The 'Futures Group' estimates, reported in the Zimbabwe Herald (op cit) reveal that if the rising population trend continues, Malawi would have to import 800 000 tonnes of grain annually by 1990 and 2.5 million tonnes per annum by the year 2000.

Furthermore, in the light of such rapid population expansion, the basis of Malawi's whole development plan, the reliance on the small-holder peasant farming system, becomes totally unfeasible. Clearly, as the population grows, less and less land will be available proportionate to the expanding population, and it will therefore become increasingly difficult to modernize the agricultural sector, let alone produce export crops.

The effects of this population explosion pervade the developmental situation even more deeply. Naturally, along with the growing population size, and the greater demand on limited land resources, there will be a rise in the size of the labour force. Even if the setback in economic growth experienced in the 1980s can be reversed, which appears most unlikely in view of the prevailing world conditions, it is certain that the manufacturing, commercial and public sectors would be unable to absorb all the new entrants into the labour force. In this regard, labour officials in Malawi, cited in Legum (1981) estimate that approximately 140 000 new jobs will be needed in the agricultural sector alone by 1990 and 196 000 additional jobs each year by 2000.

This extraordinarily rapid growth of Malawi's population will make it increasingly difficult for Malawi to produce sufficient agricultural surplus to sustain the planned social and economic development, a situation which threatens the entire future growth and stability of the nation. Thus, while attempts have been made at balanced and co-ordinated development objectives and plans in the agricultural and manufacturing sectors of Malawi's economy, the social services have tended to play a second role. In the light of the above statistics, it becomes very evident that a subsidiary position ought not to be accorded to these social services. While this is not to imply that social services warrant greater emphasis and budgetary allocations than other development areas, it would appear that in the overall development context the important role played by education cannot be understated. While the provision of higher education necessarily results in a supply of high and intermediate level skilled manpower, essential to the formulation and achievement of development plans, there exists considerable evidence to support the important role played by a

population with even a few years of education: an inclination towards acceptance of new agricultural techniques and practices; the ability to function more effectively in the commerical sector, slightly higher productivity in the industrial sector, and a receptiveness to social and cultural issues as regards family size, and health and housing facilities.

2.12 ASSESSMENT OF MALAWI'S PLANNING POLICIES

Despite attempts to introduce and implement rationally formulated, balanced development objectives, Malawi has, as was seen in Section 2.11, been faced with a considerable number of economic and political factors which seriously impede attainment of these objectives. As attempts have been made to overcome such obstacles to development, there has been a growing recognition of the need to rely more heavily on the human resources of the nation. The recognition of the implications of education for the development strategy over the past decade has caused heavy investment in this area. Malawi is now beginning to recognize the need for greater investment in its human resources, undertaking the first real assessment of the education and manpower position in 1980.

CHAPTER 3

THE CONTRIBUTIONS OF EDUCATION TO ECONOMIC GROWTH AND THE EFFORTS UNDERTAKEN TO EXPAND EDUCATION TO MEET GROWTH REQUIREMENTS

3.0 THE CONTRIBUTIONS OF EDUCATION TO ECONOMIC GROWTH

The central economic question in the past few decades has been why some countries have grown and developed faster than others. From a purely practical aspect, this question holds great import. There can be little, if any, doubt that social and economic growth in the Third World countries is desirable, whether in accordance with humanitarian aspects or criteria of international economic development. The poor and low income nations currently facing economic situations such as Malawi's, however, obviously face considerable difficulties in achieving rapid growth or accelerated development in all sectors of their economy. While the importance of a 'balanced' or holistic approach to tackling the problem of 'development' cannot be understated, it is recognised that expanded and more appropriate educational opportunities have a significant part to play in this whole 'development' process. The links between education and increased productive capacity within a country have been increasingly emphasised through recent research (Renshaw, E.F., Bowman, M.J., Unesco 1968). Educational planning has been generally accepted as an integral part of overall economic and developmental planning.

Todaro (235;1981) for instance, states that "most economists would probably agree that it is the 'human resources' of a nation, not its capital or its material resources, that ultimately determine the character and pace of its economic and social development."

Along the same lines,Harbison (1965) states that

> human resources... constitute the ultimate basis of the wealth of nations. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate capital, exploit natural resources, build social, political and economic organisations, and carry forward national development. Clearly, a country which is unable to develop the skills and knowledge of its people, and to utilize them effectively in the national economy, will be unable to develop anything else.

Of course, if such propositions are accepted by the poor nations and if greater investment is to be made in the development of human capital it is through the formal educational system that such developments will take place. Hence, the attainment of independence by many of the Third World countries was followed by a great surge to provide schooling for all children. Provision of schooling became an overriding goal, even if, as D'Aeth (12;1978) pointed out, such schooling was to consist of only four years of education provided by ill-paid teachers, based on the curricula and textbooks of the former colonial powers.

The expansion of the educational systems in these nations were thus of immense magnitude, and the real extent of such undertakings became apparent in the three major regional conferences organised by UNESCO at this time, the Addis Ababa, Karachi and Santiago de Chile Conferences.

3.0.1 The Addis Ababa Conference on Education 1961

Recognition of the close links between standards of education and the rate of economic growth in a nation was reflected in the recommendations and outcomes of the Addis Ababa Conference on Education in 1961. This Conference marked the first formal, and combined attempt by the African states to decide on their priority educational needs in order that they might promote economic and social developments. Makulu (37;1971) reports that the emphasis was placed on the role of education in modernizing African society and its importance in giving the growth a dynamism and resourcefulness to meet the huge developmental requirements. One of the most significant outcomes of the Addis Ababa Conference was then, the continuous rapid expansion of education in participating nations, in order that the target of universal primary education might be achieved by 1980. To such ends, attention focused on the expansion of primary education facilities, the goal being, in nations such as Uganda, and Kenya, to provide free education to all children of school-going age within the following two decades. (Jolly 115;1969).

The Conference drew attention not only to the severe shortage of educational opportunities accorded to young children, but also to the shortage of trained persons to fulfil requirements for high and

intermediate skill manpower levels, a situation which contrasted sharply with that of India and South America. Such findings meant that great significance was attached to the development of manpower planning techniques and the forecasting of future manpower requirements. The planning and policy implementation proposals that arose from this Conference tended to stress quantitative expansion of educational facilities, and although commitment was made to the provision of free primary education for all children, attention was focused primarily on secondary and tertiary education in efforts to meet the manpower requirements. Advanced education, technical as well as University level, was seen to be an essential development.

3.0.2 The Ashby Report on Nigeria 1960

The serious lack of trained and skilled personnel to man development projects and participate in the economic sectors of the LDCs led to further investigations of the role of education in economic growth. One of the most important outcomes of this research in Africa was the publication of the Report of the Ashby Committee which was concerned with manpower shortages in Nigeria at the time of independence. The Ashby Report stressed the value of manpower planning and pointed out the ways in which the systems of higher education could be developed to meet the requirements of trained personnel for economic growth and national self-reliance. The Report thus focused on rapid quantitative expansion of higher level educational facilities while stressing the positive effects such expansion would inevitably have on economic self-reliance. Although this approach did represent a competent exercise in quantitative planning, it did however fail to assess the appropriateness of the existing curricula and systems of education at schools and universities.

The proposals of the Ashby Report were based on the suggestions of Harbison and the findings of the Netherlands Economic Institute which concluded that "the number of university graduates and other professional men whose work requires a college degree or its equivalent, should grow at just about the same rate as national income, while likewise, the numbers of secondary school graduates should grow at approximately two-thirds the rate of national income." (cited in Blaug 73;1976).

The proposals of the Ashby Report thus focused on the proposition that over the next two decades, the ratio of educated manpower to absolute national income was of no immediate concern. The important issue was seen to be rather a real growth in numbers of educated manpower in line with any growth in GNP. Although no international comparative evidence was published to support such assumptions, it is suggested by Blaug (73;1976) that such an approach was not based on reliable assumptions.

Nevertheless the Ashby Report and its ambitious proposals had a profound influence on manpower planning practices in the Third World nations, despite the fact that it failed to adequately examine important issues such as the relevance of existing teaching techniques and educational curricula. It was tacitly assumed that the vestiges of the colonial educational systems were an adequate base on which to build the educational expansion.

3.1 THE OUTCOMES OF THE EARLY APPROACHES TO EDUCATIONAL EXPANSION

The Plans for quantitative educational expansion derived from the Addis Ababa and Ashby Reports tended then to be couched largely in idealistic, rather than practical terms, often expressing sentiments such as those illustrated by D'Aeth (9;1978) and Denison (329;1968):

- That better education would overcome ignorance and so open the way for individuals to lead richer lives, to establish better social relationships within communities, and so enable the local communities to gain in self-respect and become more democratic and responsible, more able to take initiatives for their own improvement and to become more outward looking.

- That education would improve the quality of rural life, especially the level of agricultural skills with the aid of literacy, and the opportunities for a richer cultural life.
  This approach was commonly reflected in the UNESCO reports of the 1960s (Economic Development and the Programming of Rural Education, Unesco Paris 1966 Ed L. Malassis; R. Dumont 'Agricultural Development and Education UNESCO publication 1968) and also in the attention given at this time to systems of education in the communist countries of Russia and China where a close relationship was stressed between education and rural productivity. Dumont (669;1968) reports in this regard that the underdeveloped countries might usefully copy the decisions of the Central Committee of the Communist Party of the Soviet Union (1958) regarding the inappropriateness of inherited systems of education -

> Although it gave children theoretical knowledge, the schooling did not provide a good training for practical life, did not inculcate habits of work and did not pay the necessary attention to fitting young people into the process of material production. By taking part in socially useful work the younger generation .... must gain acceptance with widely varying forms of work suited to their circumstances.

- That to improve education would contribute to economic growth thus raising the general standard of living and helping towards better employment opportunities for a richer cultural life.

- That it would improve the training in skills for the development of industries, and also modern social services, increasing the readiness to learn new techniques required for innovation and change. As Denison (329;1968) points out

> Additional education widens the range of choice open to individuals in the choice of occupation and their appreciation of alternatives, enabling them to grasp chances for economic advancement in positions where their marginal product is larger, and to find different employment when the demand for a specialised skill achieved through experience or narrow vocational training disappears. It is usually the least educated who fare worst in the process of economic change.

- That it would be the most effective means of developing a more equitable society with better opportunities for individuals in the countryside as well as in towns, with less extremes of poverty and affluence, and more responsible leaders and administrators.

- That education would contribute to nation building, by fostering a growing respect for each nation's own culture and traditions and by aiding the development of political maturity, which would be capable of combining orderly leadership with freedom of thought and expression, and respect for individual rights.

The aim for these Third World nations became the rapid expansion of a highly developed system of education, along the lines of that offered in the industrialised countries, since that was seen to be the way in which these nations had achieved their growth. Time was to show however, how costly any such expansion would be, and how inadequately the inherited system of education actually met the Third World countries' development needs. Curricula based on the Colonial system of education and emphasising the classical languages and rote learning, to the exclusion of biological and agricultural instruction, were recognised as serving little purpose in the Third World context. The role of

the universities was also questioned, with the conclusion being that "... a university in tropical Africa does not stand for conservation and continuity with Africa's past. Its purpose is to change society quickly..." (Wandira 45;1977).

The realisation that early aspirations to provide schooling for all children while also vastly expanding secondary and tertiary education levels, were far too ambitious, became increasingly clear as the governments struggled with inadequate budgets and the low quality of education being offered. Hence, early attempts to pursue the objectives of the Addis Ababa and Ashby Reports had met with little success due to the severe financial restrictions faced by these nations. Although the Addis Ababa Conference had for instance placed considerable emphasis on the cost of providing universal education, the overriding conclusion had been that foreign aid would be made available to pursue such objectives. Jolly (115;1969) reported though, that the requirements of foreign aid for this purpose actually exceeded the total inflow of foreign aid into Africa in earlier periods, and hence adequate resources were unlikely to be forthcoming from this source.

Expansion of the educational systems in these nations, even if not along the ambitious proposals of the Addis Ababa Conference, still demanded in 1962, between one-tenth and one-quarter of total government expenditure in the African nations as a whole. Jolly (114;1969) reports in this regard that over a five-year period beginning about 1959, educational expenditure more than doubled in nineteen countries of sub-Saharan Africa (out of 32 for which data was available) and tripled in six of them. In twelve of the countries, educational expenditure rose between 20% and 30% per annum. Although the rate of expenditure on education had not continued to grow at this rate in the 1970s and 1980s, outlay on this area still represents a considerable proportion of the budget.

Further research revealed in the Karachi Plan (1962) that such heavy expenditure on educational expansion could not be continued throughout the following development decades. The more resources were allocated to education the less were available for other needs, some of which,

for example, health, were important in their own right, and were not infrequently linked with the efficacy of education itself.

After almost three decades of expenditure on rapid quantitative expansion of education, the plight of the average individual in the Third World countries was little improved; income differentials between the rich and poor had become increasingly large, unemployment and underemployment reflected a huge growth rate and 'absolute poverty' was chronic and pervasive.

As a result of these factors, a reappraisal of the role of education in the developmental process had to be undertaken. It was recognised how unrealistic it was to expect educational expansion alone to lead the way to economic growth and prosperity. A more balanced and holistic approach to development planning was clearly necessary, although this was certainly not to discredit the fact that education undoubtedly did have an important symbiotic part to play in the poor nations' struggles for economic growth and advancement.

Thus, while the conclusion had been reached that investment in education should foster economic growth, the question as to how such investment affected economic growth, and what magnitude of growth could be expected, remained largely unanswered. Naturally, if policy prescriptions were to be made regarding educational investment and expansion, the answers to these issues had to be sought. It is perhaps also necessary to be more specific as to what is defined as 'economic growth' in the Lesser Developed Countries.

3.2 THE CONCEPT OF ECONOMIC GROWTH

Most typically, growth is defined, as by Denison (3;1962) as "an increase in the national product, measured in constant dollars", or more essentially as a consistent expansion in GNP.

While it is not within the scope of the thesis to enter into the extensive debate which rages over such a definition, it is necessary to point out that the definition does not go unchallenged. Perhaps the most important objection to such a definition lies in the fact

that the assumption is made that the aggregate income figures encompassed by the definition have automatically to be accepted as providing a measure of economic welfare and well-being across the society, and therefore, that any increase in GNP will be paralleled by improvements in general welfare. As Dasgupta (18;1980) points out, such straightline assumptions are not necessarily valid. For instance, increases in GNP may well represent the production of more goods and services, but not necessarily those goods and services required by society at large. Alternatively, it may well be that improvement in public welfare may not be reflected in National Income - if resources are shifted from a high cost and inefficient production sector, to a low cost, efficient one, the National Income or GNP may remain the same or even decrease, while consumer welfare is being more adequately met.

Cohn (1979) points out further shortcomings of such an index of 'economic growth' - primarily that such a measure includes only those products and services which are produced in the market place. If, as Cohn (1979) posits, the economy at large had been experiencing an increase in the importance of market place activity, as compared with home production, then some of the increase in National Income would be only apparent. On the other hand however, in an economy where there exists considerable dependence on subsistence production, as is typical in the majority of LDCs, such production fails to be accounted for in the GNP or National Income index. The National Income would then reflect a significantly depressed figure. In a developing nation moreover, it is likely that improvements in budgeting and accounting procedures will contribute to a more extensive reporting of the real extent of production. The result once again would be misleading, in that the National Income would over-estimate the growth in the economy. Furthermore, such measures fail to take account of quality changes, and thus it becomes difficult to assess whether price increases are the result of inflation in the country or simply due to improvements in production techniques and materials.

However, despite such numerous shortcomings, National Income or GNP remains the most reliable, and best empirical measure of economic progress available. The majority of investigations into growth and

development, and the formulations of policy and development programs thus remain heavily reliant on this measure, and indeed, the contributions of education to economic growth are also couched in this term

3.2.1 The Categorisation of the Third World Nations by Economic Growth Potential

As has been discussed in Chapter 1, the Third World countries have been typified by their low rate of growth, low GNP per head and low levels of productivity, sometimes despite the existence of fertile land and good supplies of natural resources in their nations. Many of these poorer nations have moreover, been severely affected by the onset of the 'oil crisis' in 1973 and the subsequent high costs of raw fuels, while also experiencing a shortage of skilled personnel, a lack of secondary development and rising inflation along world trends. Todaro (1981) and D'Aeth (45;1978) in line with the World Bank Report (30th September 1978) state that since the onset of the fuel crisis, and the greater strain this placed on the developing economies, the Third World nations have become polarised into three divergent groups in terms of the 'economic growth' potentials:-

- Firstly, the 'fast growth' countries, which like Peru and Nigeria, have been fortunate enough to possess their own oil and mineral resources which they export. World Bank estimates reported in 1980 that these nations accounted for a population of approximately 400 million or 20% of the 2 billion people living in the LDCs.

- The second group of nations fall into what have been termed the 'moderate growth' countries, and include those LDCs which have fairly reasonable prospects for long-term growth and have per capita incomes (in 1977) of over US $200 per annum. During the period of analysis, Todaro (116;1981) estimated that this category, which included countries such as Mali, Niger and Zaire, accounted for a population of approximately 600 million.

- The nations encompassed in the Third grouping however, termed the 'negative growth' countries, reflect fairly dismal growth prospects, having been adversely affected by the 'oil crisis', and being burdened with a huge and rapidly growing population to support - estimated in the World Bank Report (1975) as being around the figure of 1 billion people. Per capita incomes are excessively low and frequently unevenly distributed among the population. These countries are further identified by their heavy reliance on agriculture, and the inability to provide capital investment in their economy or to attract such investment in their economy by other

> nations. What little investment is obtained through aid programs is frequently offset by the rapid population increases. In instances where aid has been obtained it has frequently resulted in some growth in poor countries, but has failed to alter the situation of the poor people - a situation which Lipton (28;1977) terms "growth without development".

Clearly, the categorisation of nations according to their growth potential is closely related to the availability of readily exploitable natural resources in the country, but more importantly on the availability of trained manpower to exploit such reserves.

The nations of the 'negative growth' category, and to a large extent, those of the 'moderate growth' category too, have typically to depend on rural development and planning, as limited resources prevent plans involving rapid investment in the modern sector being effectively implemented. Readily exploitable resources tend to be relatively scarce, while the vast proportion of the population has received little or no formal education. The outcome of such an emphasis on rural development, as D'Aeth (1978) points out, is that around 70% of the total population of two billion in the LDCs, will be engaged in agriculture and the rural sector, the area upon which developmental policies must focus, since it is generally accepted (Lipton 23;1977:UNESCO 1963: World Development Report 1980) that developed mass agriculture is a prerequisite to successful development in other sectors. For, as Streeten (89;1972) points out, in early development, with labour plentiful and the ability to save scarce, small farming is especially promising, because it is the part of the economy in which a given amount of scarce investible resources will be supported by the most human effort. Thus, it is emphasis upon small farming which can most rapidly boost income per head to the levels at which the major sacrifices of consumption required for industrialisation can be undertaken without intolerable hardship and repression.

Any such development action as is undertaken in the rural sector however, must still be well planned and co-ordinated with the overall development objectives and plans for economic growth. For, clearly, any development planning with these nations will as a consequence be heavily dependent on agricultural production and increased output in this sector.

3.3 HUMAN RESOURCE PROBLEMS ASSOCIATED WITH NATIONS EXPERIENCING ECONOMIC GROWTH DIFFICULTIES

However, quite apart from the theoretical difficulties involved in measuring economic growth and categorising the LDCs, planners have also to take note of the fact that these nations clearly face considerable practical and financial difficulties in initiating and stimulating any such economic growth. Many of the difficulties involving retarded economic growth, as were revealed in the Reports deriving from the United Nations Third Development Decade, are closely related to human resource problems, among them a shortage of skilled manpower, and a malnourished and unhealthy population, which however, continues to increase rapidly. Moreover, with the development of some manufacturing organisations and the growth of the urban sectors, the human resource problems become increasingly complex - the rural areas remain stagnant backwaters, and while widespread underemployment exists in the rural sectors, rising unemployment typifies the modern sector to which the population migrates from the poverty-stricken rural areas. Paradoxically, there frequently fails to be much incentive for persons to engage in activities which are often vital to the national development process, and most of the small number of skilled and trained personnel are drawn to opportunities in the private entrepreneurial sector, resulting in a situation of "urban bias" whereby there is migration of the rural population to the urban areas, resulting in growing numbers of unemployed and ill-housed people. In this regard Edwards (13;1974) reports that official statistics in Guyana revealed an unemployment level of 40.4% of the population between 15 and 24 years of age, and a 39% unemployment level in Ceylon in 1968, most of this sector of the population being resident in the urban areas.

Thus, the underdeveloped countries have typically a very clearly defined employment structure, with the majority of the population, some 70 to 80%, directly engaged in agricultural activities. The agricultural sector of the economy however, tends very largely to be of a subsistence nature and is characterised by very low levels of productivity. Hence, most of the output of this sector is consumed directly by the agriculturalists themselves in an attempt to feed and clothe themselves. Naturally, this means that the vast majority of the

population produce little beyond their own needs and are able to participate in the cash economy only to a very marginal degree. Thus, as Singer (42;1964) points out, productivity in agriculture, levels of income and employment structure form an interdependent equilibrium system. The equilibrium which they determine by their interaction in an underdeveloped country is a low level equilibrium.

3.3.1 "Urban Bias" and the Persistence of Poverty

This dualistic growth pattern whereby rural areas remain largely neglected and poverty-stricken, and the few urban areas reflect some growth in size and productivity, was in part largely reinforced in these nations by early development directives. The main targets for development in the initial periods of independence were seen to be largely the small-scale industrialised and modern urban sector as is reflected in some of the earlier approaches to the problem of bringing about 'accelerated development':

> It is only the imposition of compulsory levies on the agricultural sector itself which enlarges the supply of "savings" in the required sense for economic development. (N. Kaldor, cited in R.B. Bangs Financing Economic Development, Chicago 1968, p.22)

> The shuttle pattern of migration has many advantages (especially in) a dual economy in which the urban sector represents modern industrial activities and the rural sector is still traditional agriculture. In such situations the apparently less developed side of the society can provide many of the social overhead and welfare facilities for the more developed side without the need for extensive new investments. (L.W. Pye "The Political Implications of Urbanisation and the Development Process" cited in Breese (Ed) The City in Newly Developing Countries. Prentice-Hall 1969, p. 402).

Hence, these small urban areas or growth points came to be regarded as symbols of 'economic development' and 'progress' while investment in 'social development' occurred through the expansion of educational opportunities in these areas. Thus the overriding belief was that investment in the urban areas would bring about substantial improvements in overall growth, and that the development of the stagnant rural areas would be propelled by such expansion elsewhere in the country. Such notions were reflected in theories of the development

process, such as Rostow's "Stages of Economic Growth" (1969) and in many of the early approaches to 'solving' the 'development problem'.

3.4 THE OUTCOMES OF THE EARLY APPROACHES TO THE PROBLEMS OF ACCELERATED DEVELOPMENT

The optimism which accompanied the early development programs was however, short-lived. Growing imbalances between the urban and rural areas became increasingly apparent; there was increasing migration to the urban areas with consequent social problems, while financial budgets could not possibly be stretched to provide housing, health facilities and education opportunities for all in the urban areas on the same line as in the developed nations, as is reflected in Table 3.5 which gives a comparison of the ratio of costs of 'fast growth' and 'moderate growth' and some 'negative growth' countries of education.

Industrialisation was unable to provide an answer to this concomitant growth of urban slums and rising unemployment, with the result that the LDCs were forced to turn their attention to development of the rural areas. With the start of the United Nations Second Development decade, broader attempts were made to stimulate rural development and to encourage simultaneously the improvement of nutrition, housing and health facilities along with the provision of more appropriate and equitable educational opportunities in these areas.

3.5 THE ROLE OF EDUCATION IN "ACCELERATED DEVELOPMENT"

The more pertinent issue in this instance, however, is in what way education could affect the rate of economic growth in the country, such that it would stimulate positive development across all sectors. Basic issues as to the importance of the role of formal education are presented by Todaro (237;1981) with the requirement that such issues be carefully investigated to enable planners to reach conclusions regarding the relationships and important two-way links between education and these key components of the development process.

3.5.1.1 The Effects of Education on Economic Growth

It must be considered exactly in what ways education affects the rate, structure and character of economic growth within the poor nations. Once the connection between education and the availability of skilled and qualified manpower and economic development has been recognised, little further investigation of the situation was carried out. The straight-line assumption was that the LDCs lacked skilled personnel who could only be trained through the formal educational system, and thus, until such time as the educational system was improved upon and expanded, the public and private sectors would remain 'undeveloped'. The natural response to such assumptions was to increase investment by building up human resources which had in the past development plans been subjugated to expenditure on physical capital infrastructure. Developmental priorities began then in the 1960s,on the basis of the findings in the Addis Ababa and Santiago de Chile Conferences, to focus on rapid quantitative expansion of human resources in an attempt to provide the personnel necessary to generate economic growth. While such a strategy undoubtedly did contribute to aggregate economic growth, it tended to be somewhat naive in its assumption that such growth would be distributed evenly throughout the economy. What in fact occurred was a distribution of the benefits of economic growth to a small and elite sector of the educated, urbanised population, while the mass of the population in the rural areas remained relatively unaffected by any growth in the GNP, a situation which began to draw increasing attention, as reflected in the findings of the Pearson Report on International Development of 1969.

In line with such reasoning, it would also be necessary to investigate the ways in which economic growth itself influenced the nature and organisation of the education system.

3.5.1.2 Education and the Reduction of Poverty

There is also the requirement that attention be given to the issue as to whether education, and in particular, the educational systems of the Third World, contribute to or retard the growth of inequality and poverty.

As has been pointed out, (Lipton 1977; Blaug 1976; Malassis 1966), due to the emphasis on rapid quantitative expansion of educational opportunities in the 1960s, the effects of such an expansion tended to neglect to affect the distribution of poverty within the LDCs. Todaro (259;1981) in this regard, cites recent studies demonstrating that educational expansion, rather than being a general force for equality, has in fact had quite the reverse effect and increase income inequalities. KiZerbo, former Minister of Education in the Upper Volta reported in this regard that:

> The school in many underdeveloped countries is a reflection and a fruit of the surrounding underdevelopment, from which arises its deficiency, its quantitative and qualitative poverty. But little by little, and there lies the really serious risk, the school in these underdeveloped countries risks becoming in turn a factor of underdevelopment. (cited in Todaro op cit.)

Much of this increase in inequality has been the result of the very positive correlation between a person's level of education and his lifetime earnings, especially so in nations which have not implemented Wages and Incomes Policies. Income differentials for workers who have completed university or even secondary school, over those who have obtained only a few years of primary school, tend to be in the region of 300 to 800%. (World Development Report 49;1980). Adelman (388;1966) in implementing a Linear Programming Approach to educational planning in Argentina, similarly postulated that the income differential for a university graduate as opposed to a secondary school graduate, tended to be in the region of 350%. The impact of such severe differentials on inequalities is magnified by the fact that it is generally only students from the upper and middle income brackets who can afford, in financial or opportunity cost terms, to attend secondary school or university.

The private 'costs' to a low income family of giving up a child's labour in order that it might attend school are frequently too high for the family to accept. Hence the benefits of education are frequently lower for the poorer income groups than the higher income brackets, and as a consequence the drop out rates are much higher for these groups. The net result is that the educational system then serves to perpetuate and even reinforce existing inequalities.

3.5.1.3 The Links Between Education and Migration Patterns

Important also is the relationship between education and rural-urban migration and urban employment. Linked with this issue is the fact that some Third World countries, most notably India, are experiencing rising levels of 'educated unemployed' in the urban areas. Reasons for such a situation obviously need to be sought. Numerous studies (Schumacher 1978; S.R. Lewis' study on Pakistan (1969) and a series of International Labour Reports, among them "Matching Employment Opportunities and Expectations - A Program for Action in Ceylon" (1971) and "Employment, Incomes and Equality - A Strategy for Increasing Productive Employment in Kenya" (1972) have yielded significant evidence that increased educational attainment does tend to increase an individual's propensity to migrate to urban areas. The reasons for such migration are fairly obvious: faced with high urban-rural income differentials, the better educated rural individual will seek work where he is most likely to maximise his earnings. Bruton (cited in Edwards 77;1974) reports in this regard that the differentials between probability and profitability of employment in the rural and urban sectors of the LDCs are so great that it is more advantageous for the individual who has received some education to accept periods of unemployment in town, rather than remain in the rural areas. The emerging consequence of such factors has been a rising level of educated unemployed in the urban areas, and a resultant scarcity of even primary-level educated manpower in the rural sectors of the economy.

3.5.1.4 Education and Population Growth

Closer investigation needs to be undertaken to establish the relationship between education and women and their desired family size. While the relationship between educational attainment and family size is not clearly understood, there is considerable evidence available from numerous studies (Jones 1975; U.N. World Population Prospects 1965-2000; Ominde and Ejiogu 1972) of a direct correlation between the two factors. The consequences of a reduced population growth are not immediately felt by the nation concerned, but it does within a few years increase a country's propensity to save and invest in developmental priorities,

rather than merely expanding already low levels of social services. Most obviously, as Jones (4;1975) points out, a reduction in birth rates would assist in the qualitative and quantitative expansion of the educational opportunities in the LDCs, a factor which would in turn have important implications for population stabilisation.

3.5.1.5 Education and Agricultural Development

A most important issue to consider is whether prevailing Third World educational systems tend to promote or retard agricultural and rural development.

It has become increasingly clear that the low-income oil importing nations such as Malawi, have little option but to formulate their future developmental objectives on the basis of a carefully planned increase in agricultural growth. While the development projects of the 1960s emphasised the development of a few major urban growth points in the LDCs, recent experience indicates the necessity of achieving a better balance between rural and urban development, particularly in view of the fact that approximately 80% of the population of the LDCs are agriculturally based(World Bank 1980)Increased reliance is also being placed on agricultural development in attempts to achieve a more balanced or holistic growth and a more equitable distribution of the benefits of growth among the population such as a more equitable distribution of income, access to arable farming land, and availability of improved health, housing and formal education facilities. Such an approach is evident in projects such as the Chilalo Agricultural Development Unit (CADU) established in Ethiopia and the "Education for Self Reliance" plan introduced in Tanzania under President Nyerere.

Examination of the primary school systems in most Third World nations reveals that their syllabus seldom has any practical significance for the rural population, (Makulu ;1971). The situation is however, somewhat different in the centrally controlled economies. The most notable among these nations are China with its "walking on two legs" ideology of appropriate education, Tanzania and Cuba where there is also a strong emphasis on non-formal education and programs to take urban scholars to study in the rural areas. (Fagan 1969). However, in

the majority of the Third World nations, the syllabus of schools is identical to the earlier colonial syllabus, formulated to suit the industrialised nations' requirements with a heavy emphasis on qualifying examinations. Such systems of education evidently contribute little towards the improvement of levels of agricultural productivity and do not assist the student to function more effectively in the rural environment. Curriculum reform has, since the early 1970s received more attention, with the publication of a number of UNESCO and World Bank reports on the matter (World Development Report 1980; J. Alles Curriculum Change in Developing Countries Unesco Report 1970, G.A. Hay (Ed.) Unesco Report 1976) but generally there has been limited practical reform to date.

3.5.1.6 Education and the Brain Drain

Finally - it is important to establish what is the relationship, if any, between Third World educational systems, developed country educational systems, and the international migration of highly educated professional and technical manpower from the LDCs to the more developed nations.

As has been discussed in Section 3.1.5.1, many of the formal educational systems existing in the Third World countries are modelled very closely on those of the 'developed' nations, and thus tend to be inherently dysfunctional in the poor country context. Thus, what skilled manpower is trained in the LDCs obtain their skills along lines suited to developed countries' requirements, with the result that this manpower frequently obtains more competitive salaries and greater chances of advancement in the industrialised states. Consequently, there is a 'brain drain' from the poor to the rich nations, particularly of the professional skills such as engineers, doctors and scientists, which have been trained at huge cost to the poor nations.

The effects of the 'brain drain' are however, more insidious than the simple migration of professional personnel from the poor countries.

The international 'market' for the highly trained personnel tends also to divert the attention of these personnel from the existing situation

and development requirements of their resident nation. Thus, such important areas as 'appropriate technology', the construction of low-cost health care and hospital facilities, and provision of housing and schooling facilities, tend to be pushed aside in attempts to compete with international standards. Todaro (262;1981) sums up the situation by stating that

> while it is difficult to quantify in terms of rates of economic growth and levels of poverty, the combined 'brain drain' and outward looking orientation of many LDC professionals has no doubt been an important contributing factor to the perpetuation of conditions of underdevelopment in Africa, Asia and Latin America.

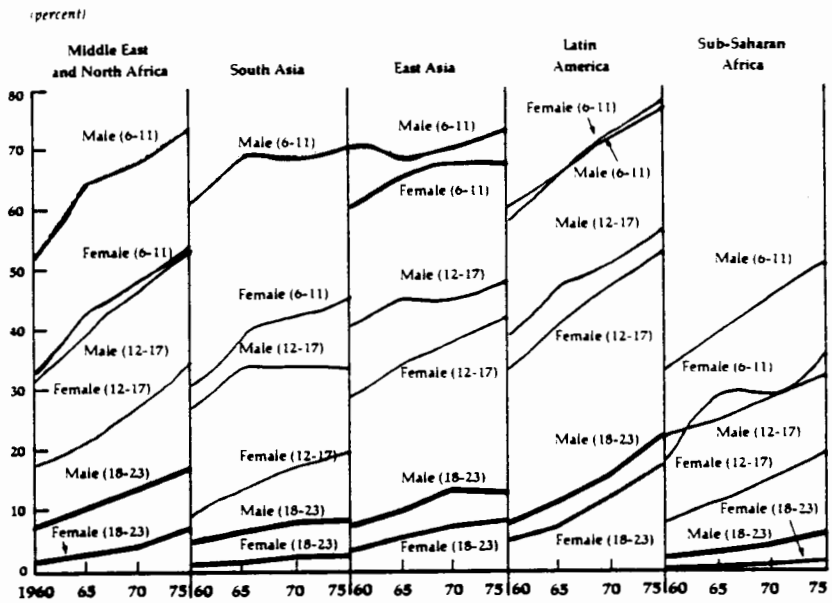
3.5.1.7 Education and the Need for Curriculum Reform

It has been posited (D'Aeth (50;1978) that the provision of formal education in the Third World countries has met with both quantitative and qualitative failure. Statistical information presented by UNESCO (1979) reveals large discrepancies in school enrolments between sex groups and between urban and rural areas. Enrolments are of course considerably higher in urban areas and far lower for females. Moreover, it appears on average, many children attend school for less than 4 years, while only one child in four, and sometimes only one in ten attain the rudimentary basics of literacy. These factors are evinced in Table 3.1 which also points to the exceptionally low percentage of the population in Sub-Saharan Africa receiving even primary education.

Furthermore, the syllabus is frequently inappropriate, providing a general knowledge suitable for those students who will advance to secondary level, rather than providing practical information suitable for reference to the child's immediate environment. D'Aeth (61:1978) sums the situation up adequately

> The unsuitability of existing schools ... divorce children from their rural communities, ignore their culture, inculcate unsuitable attitudes related to urban life and fail to encourage an understanding of the environment in which they live. As far as rural development is concerned, they often do more harm than good.

Table 3.1 Enrolment Ratios, by Region, 1960-75



(Source: World Bank Development Report; 47;1980)

It is however, not only the content and syllabus of these schools that is inappropriate. The teaching methods employed frequently also reflect outdated techniques and low quality. As was reported by a former Deputy Director of UNESCO -

> The learning techniques ... remain the same: the rote method, the techniques of cramming, and once the exam is passed, of forgetting all these useless impedimenta. The exam system is not an evaluation of a student's personality and intellectual equipment, his powers of thinking for himself, reflection and reasoning. It is a challenge to resourceful deception and display of superficial cleverness ... Looked at as a business enterprise, the school and college present a woebegone spectacle. We find in education antediluvian technology which would not survive for an instant in any other economic sector. The teaching methods and learning techniques are rusty, cranky, and antiquated. (In UNESCO readings 1968).

Such poor teaching practices are frequently a reflection of the poor quality of education which the teachers themselves have received and the lack of motivation and incentive derived from what are frequently inadequate salaries and the numerically huge classes they must cope with.

Such inappropriate educational systems exist despite the widespread belief in the 1960s that educated and trained people were likely to be the 'key' to development. Universal literacy became a fundamental goal for these nations as was reflected in the proceedings of the Addis Ababa Conference of 1961 when political commitment was made to achieving these goals regardless of the excessive size of the budget involved. (Jolly (1969) points out that the plans were so ambitious that for their implementation they relied on a flow of foreign aid that exceeded the total inflow of foreign aid into Africa in earlier periods.)

3.6 CONCLUSIONS REGARDING THE REFORM OF EDUCATIONAL SYSTEMS IN THE LDCs

The recognition of the important role which education had to play in pursuing economic growth and development in the poor countries, has, in many instances, led to the reorganisation and revision of purposes of many of the educational systems in these countries. The more socialistically inclined developing nations were among the first of this group of nations to undertake such changes in purpose as is reflected in President Nyerere's statement on the role of the university in Tanzania in 1966:

> The university in a developing society must put the emphasis of its work on the subjects of immediate moment to the nation in which it exists, and it must be committed to the people of that nation and their humanistic goals... We in poor countries can only justify expenditure on a university - of any type - if it promotes real development of our people... The role of a university in a developing nation is to contribute, to give ideas, manpower and service for the furtherance of human equality, human dignity and human development. (Nyerere 6;1967).

While recognition was accorded to the importance of education and the need for rational long-range planning in this area, the important question remained as to how the effects on growth of educational expansion could be quantified. In order to establish plans and determine future educational expansion needs and programs, investigation needed also to focus on public expenditure levels, cost and earnings differentials, enrolment and dropout ratios along with the demand for, and supply of, school places, and the eventual private and social

benefits and costs to be obtained from any such investment in education.

In this regard, numerous propositions, (as cited in Section 3.5.1.1) have been put forward as to how, and to what extent education affects growth, but Miller's (1967) writings provide a fundamental insight into the situation. Miller suggests that if education is to promote economic growth, it must be carefully structured with this purpose in mind - "not just any kind of education will promote economic growth. Education is a source of economic growth only if it is anti-traditional to the extent that it liberates and stimulates as well as informs the individual and teaches him how and why to make demands upon himself."

Accordingly, Miller (op cit) suggests that a suitable educational strategy for LDCs would encompass four 'growth-producing capacities':

i) The development of a 'general milieu favourable to economic progress', i.e. a degree of social mobility would be encouraged, along with a general increase in literacy necessary for improved communication and record keeping.

ii) The educational system would emphasise the development of 'complementary resources for factors which are relatively plentiful and substitutes for comparatively scarce factors', e.g. the use of natural resources is augmented by education, as the latter provides managerial talents that can exploit resources more effectively.

iii) The third capacity concerns the durability of educational investment: Miller states that educational investment should have greater durability than most forms of non-human reproducable capital.

iv) The fourth 'growth-producing capacity' concerns the fact that education poses an alternative to consumption or private investment in non-human capital and is thus an investment in long-term development.

While the structure of the educational system, as Miller (1977) points out, is of obvious importance if it is to stimulate growth, the World Development Report of 1980 reflects that even general education appears to give rise to a more productive and effective population. Even a very limited period of formal education appears to encourage the development of general reasoning skills (i.e. cognitive skills), while also inducing changes in attitude towards work and society (non-cognitive effects) both of which have been closely linked to improved performance

in the economy. Attempts to measure quantitatively such changes in attitude and reasoning skills, have tended to focus on aspects of 'modernity' of outlook. While such measures have clearly questionable reliability due to their very nature, it would appear that increased 'modernity' of outlook towards such divergent aspects as family planning and voting patterns, are positively influenced by the level of schooling received by the population. A receptiveness to such issues by the population could only be to the nation's advantage in the long-term.

The World Dev Report (1980) also presents evidence from a number of studies which reflects the positive effects of even primary school education on individual productivity and earnings, whether on a subsistence or employment basis. These results are further supported by the findings of Cost Benefit studies carried out by Blaug (249;1976) who reports that "literacy may contribute to economic development by:

a) raising the productivity of new literates
b) raising the productivity of individuals working in association with literates - the so-called 'first-round' spill-overs of literacy.
c) Reducing the cost of transmitting useful information to individuals (say, about health and nutrition) by creating, as it were, a new channel for disseminating knowledge
d) stimulating the demand for vocational training and technical education, and
e) strengthening economic incentives, meaning the tendency for people to respond positively to a rise in the rate of reward for their efforts.

Such findings have considerable import for LDCs, particularly those with a heavy reliance on a subsistence agriculture base, such as Malawi. Much of the evidence supporting such propositions has indeed been gathered from agricultural areas in studies which compared the productivity yields and 'innovative activity' of schooled and unschooled farmers.

As is evident in Table 1.1, there appears to be considerable support for the notion that elementary education increased productivity of the farmers. Where 'complementary' inputs, such as good seed and fertilizers required for improved farming techniques were available, the output of

farmers who had received four years of schooling was on average 13.2% higher than those who had not been to school. In fact, even in cases where the 'complementary inputs' were not available, farmers who had received elementary schooling still produced significantly higher outputs.

The assumption then, is that some schooling enables people to obtain and evaluate information about improved techniques and new opportunities while evaluating future risks and alternatives. Before Development plans incorporate such aspects in their formulations for educational planning however, it is necessary to determine whether such increases in productivity as are achieved through increased educational opportunities are substantial when compared with the financial costs involved in providing the education facilities. The World Bank (1980) reports that on the basis of a series of studies that compared the increase in production resulting from education with the costs of providing that education, results reflected favourable rates of return when compared with investments in other sectors, - "it would thus be short-sighted to leave a large part of the next generation of farmers illiterate". (World Development Report, 48;1980).

Increased educational opportunities have also been closely linked with higher productivity and increased income in the manufacturing and private sectors. Here too, education has been found to instil a responsiveness to further vocational, on-the-job or informal training. (Blaug 1976). While most studies reported in the World Bank Survey dealt with relatively large urban areas, similar results were found for small business and trading concerns... And when the extra earnings resulting from primary education are weighed against the costs, high rates of return were consistently found in those nations where attempts had been made to introduce a "functional" or practical system of education. Similar studies for secondary and higher education found lower, though still significant returns on the investment, as reflected in Table 3.2 below.

Table 3.2 Rates of Return to Education

(per cent)

Country group	Primary	Secondary	Higher	Number of countries
All developing countries	24.2	15.4	12.3	30
Low income/adult literacy rate under 50 per cent*	27.3	17.2	12.1	11
Middle income/adult literacy rate over 50 per cent	22.2	14.3	12.4	19
Industrialized countries	-	10.0	9.1	14

Note: In all cases, the figures are "social" rates of return: the costs include forgone earnings (what the students could have earned had they not been in school) as well as both public and private outlays; the benefits are measured by income before tax. (The "private" returns to individuals exclude public costs and taxes, and are usually larger.) The studies refer to various years between 1957 and 1978, mainly in the latter half of the period.

*In this sample of 30 developing countries, those countries with low incomes also had literacy rates below 50 per cent (at the time the studies were done). All the middle-income countries had literacy rates above 50 per cent.

(World Dev. Report, 49;1980).

3.7 THE FINANCIAL COSTS INCURRED WITH EDUCATIONAL EXPANSION AND REFORM

Such findings on the important part education has to play in increasing productivity and stimulating the development effort, has led to a new outlook on educational development in the Third World countries. Educational expansion has come to be seen as an integral part of the overall development process.

The cost of the expanded provision of educational facilities however, as with other social services, falls heavily on the government of those nations, and subsidization of school fees has become an important issue. The elimination of school fees is far more necessary in poor countries than wealthy ones, in view of the low per capital income, but these are precisely the nations which are most likely to be unable to meet such costs. These nations, which fall primarily into the World Bank's two categories of 'moderate growth' and 'negative growth' countries, as discussed in Section 3.2.1, are thus faced with the problem that

they will not be able financially to provide universal education at the primary level, let alone subsidize schooling at all levels. The position, moreover, is unlikely to improve according to World Bank reports (1981) especially with the continuing decline in incomes, the slowing growth rate recorded in GNPs, and the world inflationary trends.

The cost of providing even primary school education is comparatively high in these poor countries, especially those in the 'negative growth' category. Particularly in those nations which have not introduced a Wages and Incomes Policy, the situation has arisen whereby the salaries of teachers and the recurrent costs involved in schooling, are very high in relation to the GNP per capita, even despite the very low quality of education being offered. The cost differentials involved in the provision of education and the necessary facilities are evident in Tables 3.4 and 3.5 which reveal the costs for some of the wealthier and poorer nations. D'Aeth (46;1978) illustrates this point with reference to the state of Mali - here the estimated cost of primary school education per annum for one child is 16 000 Mali francs. The average income per head however, averages a mere 40 000 Mali francs, the result being that primary education costs approximately 40% of the average person's yearly income. Situations similar to the one existing in Mali are by no means uncommon in the poor Third World countries, with the consequence that educational opportunities even at the primary level, have been available to few outside the major urban centres.

3.7.1 The Effect of Population Expansion on Costs of Educational Expansion

The possibilities of providing adequate educational facilities for all children become ever more remote however in view of the population increase experienced in these nations. In fact, even despite the attempts which have been made at rapid quantitative expansion of schooling facilities, the real numbers of children attending school have dropped, precisely because of this population growth. The actual extent of such a population increase is reflected in the UNESCO statistics (cited in D'Aeth 1978): During the ten years between 1960

and 1970, there was a reported increase in enrolment for education in the LDCs between the 5 - 24 age group from 324 million to 482 million (figures exclude China, North Korea and North Vietnam). Of this overall increase of 158 million, approximately 100 million were enrolled at the primary school level. While such figures alone would give rise to a reasonable degree of optimism over the situation, they tend to hide the fact that during the same period the number of children not enrolled at any educational institution rose by 165 million. In other words, the number of children was expanding more rapidly than the number of new places being provided at schools. Moreover, with the declining world situation and increased inflationary tendencies, the rate of school expansion has been cut back since this period - there is clearly little prospect of providing schooling and educational facilities for all children in the foreseeable future.

3.8 CONCLUSIONS REGARDING RAPID QUANTITATIVE EXPANSION OF EDUCATIONAL OPPORTUNITIES

While it is obviously important to provide educational opportunities within the nation on humanitarian grounds, and the plea has often been made for free and equal opportunities for education for all in the Third World countries, this issue of rapid quantitative expansion of educational opportunities has given rise in many instances to negative rather than positive consequences. Even though higher educational opportunities have initially been correlated with reduced family size, increased productivity and aggregate economic growth, evidence is beginning to accumulate pointing to the fact that continued rapid quantitative expansion of the formal educational system may paradoxically, in the long term merely exacerbate social problems such as internal migration (Section 3.5.1.3) and population expansion. This is likely to be found, in particular, in instances where the country is quantitatively expanding the educational system with already strained resources. Todaro (1981) puts forward two major reasons why such a paradoxical situation could arise. In the first instance, unqualified rapid expansion of formal education at the primary level naturally created great demand on the supply side for increased opportunities of higher education, frequently to the extent that real resource needs are exceeded. Accompanying this expansion is a rural-to-urban migration as people seek to maximize their returns invested

in education. The urban areas, unable to accommodate the increasing numbers, become centres of the educated unemployed who reflect increasing political discontent.

In the second instance, the unqualified quantitative expansion of the formal education system results in increasing numbers of women receiving education which for cultural reasons would otherwise possibly not be available to them. Such a situation could initially result in reduced family sizes as the women become increasingly aware of the rise in the opportunity cost of their time in child-raising activities. However, quite the contrary situation could arise if insufficient employment opportunities were open to women, giving rise again to a socially discontented, politically vocal population.

3.9 THE NEED FOR THE PROVISION OF "APPROPRIATE" EDUCATION

Yet, despite the difficulties incurred when rapid expansion of education facilities is undertaken, as evidenced in Section 3.1, there can be no doubt that education does have an essential part to play in stimulating development and reducing features which the United Nations Third Development Decade saw as important obstacles to the development process,such as rapid population increase, malnutrition and poor hygiene. It follows then that if education is to contribute in any positive way to "development", it must somehow involve all children in an appropriate way - it is not adequate to provide facilities for some children and nothing for others.

The problem facing such poor countries is to provide one uniform educational system providing the same opportunities for the very different needs of the small modern sector and the large low income rural population. This is particularly important in view of the fact that, as was mentioned earlier (Sections 3.5.1.5 and 2.3.1.2.2) these nations must focus on the development of their rural and agricultural sectors in formulating their development policies.

Apart from the dichotomy existing between educational facilities and requirements of the urban and rural areas, the LDCs are further confronted with the persistent, yet paradoxical problem of having a

severe shortage of skilled and trained manpower in the modernizing urban sector and a large surplus of unemployed and underemployed manpower in the traditional and rural sectors. While such a situation poses a variety of development problems from the social aspect, the shortages and surpluses of human resources are part of one complex development issue. These are divergent situations both having their origins in the developmental changes taking place in the LDCs, and are likely to be increasingly aggravated by development unless steps are taken to prevent it.

However, attention in the majority of the LDCs has tended to be focused, not surprisingly, primarily on the most urgent manpower shortages of the country, which pose immediate interference with the implementation of developmental plans, rather than on the growing mass of under- and unemployed people. Investment in education has thus tended to be almost exclusively in these areas, with the resultant neglect of human resource development in other important areas. Consequently, there is a continual and recurring shortage of trained and skilled personnel in certain fields. While it is clear that no two developing countries are likely to experience the same shortages or bottlenecks and surpluses of skills, an assessment or manpower analysis of the situation can lead to further clarification of the individual situation.

Indeed, the structure of the educational system will be closely linked to the economic and social characteristics of the particular country, in turn, generally tending to reinforce and perpetuate such characteristics, unless specific attempts are undertaken to induce reform within the structures of the country at large. Any such analysis that is undertaken of the existing manpower situation will tend to reveal existing inequalities in the economy and society and possibilities for areas of reform.

The primary purpose of such an analysis however, is three-fold - it would assist in identifying the principal shortages in each sector of the country, while also yielding an analysis of the reasons for such shortages as exist; it would identify the surpluses of both skilled and unskilled labour and again, the reasons for such surpluses; and thirdly, the analysis would establish realistic targets for human

resource expansion in the various sectors of the economy.

The extent and success of such a manpower analysis is evidently restricted by the inability to carry out an entirely exhaustive survey of the existing situation and more especially by the shortage or absence of reliable statistical information which plagues planners in Third World countries. At best, such an analysis could yield a vaguely objective outline of the country's main human resources and an "informed guess" as to probable future trends.

Psacharopolous (1972) as a result of cross-country comparison, has identified the areas of the modernizing economies most likely to be affected by shortages of skilled personnel:

- In all LDCs there is likely to be a shortage of highly educated professional manpower, such as engineers, doctors, veterinarians, etc. The few persons trained to these levels however, are generally found to prefer to be stationed in the major urban areas, rather than in the rural sectors where their skills are most urgently required. The scarcity of such manpower is therefore magnified by the relative immobility of the people.

- The most severe shortage of skilled personnel is likely to be found amongst the sub-professional personnel, such as technicians, health workers and nurses, agricultural supervisors, etc. The shortage of personnel in these vital areas is aggravated by the fact that most Third World nations fail to recognize the importance of manpower trained in these areas, and to overemphasize the need for highly qualified professionals. Moreover, the few persons qualified to enter the sub-professional fields, are generally drawn by the possibilities of higher pay and prestige to enter the universities to train for professional positions. To compound the situation even further, few LDCs, India being a particular example, have made adequate provision for training opportunities in the sub-professional fields, providing rather, university level facilities at greatly increased cost.

- Despite the emphasis on tertiary education the shortages of manpower are extended in the LDCs to top-level managerial and administrative positions, which have been, and will continue to be filled by expatriate personnel at internationally competitive salaries. Entrepreneurial skills are also, according to Todaro,(1981) seriously lacking, and what small-scale businesses do exist, have generally also been controlled by foreign interests.

- One of the most important 'bottlenecks' retarding the entire developmental process, concerns the shortage of adequately trained teachers at all educational levels, but more particularly at the secondary school level and in the science fields. Moreover at primary school level, frequently the LDCs have been forced to rely on primary school

teachers, who themselves have received no education beyond primary school, while those with more adequate qualifications are attracted to more highly paid jobs in the civil service and private enterprise.

- The LDCs are moreover, characterized by a shortage of craftsmen in all fields, be it secretarial, clerical or bookkeeping work.

In view of the obvious importance of manpower trained in the above skills to the planned development of a nation, it becomes clear that there is a need to treat the formation of human capital and resources as complementary and analogous to saving and investment in material and capital resources. For, as Cohn (1979, Chapt.11) points out,

> in designing a strategy for development, one needs to consider the total stock of Human capital required, its rate of accumulation and its commitment to (or investment in) high priority productive activities... The rate of growth of a country is associated with both its stock and rate of accumulation of human capital. High level manpower is needed to staff new and expanding government services, to introduce new systems of land use and new methods of agriculture, to develop new means of communication, to carry forward industrialisation, and to build the educational system - i.e. innovation or the process of change from a static or traditional society, requires very large 'doses' of strategic human capital. The countries which are making the most rapid and spectacular innovations are invariably those which are under the greatest pressure to accumulate this kind of human capital at a fast rate.

3.10 THE PLANNED EXPANSION OF THE EDUCATION SYSTEM

An important issue concerning the need to invest in expanded educational facilities is the level of financial investment required over a considerable time period. While some Third World nations have followed a somewhat erratic policy of expanding educational facilities when economic growth rates were favourably high, and restricting educational opportunities during adverse periods of growth, the increasingly severe economic climate of the late 1970s and 1980s has shown the need for a more rationalised, co-ordinated approach to the problem. While theories as to how educational planning and educational expansion should take place abound, the difficulties of formulating a much demanded quantitative and prescriptive approach to the problem are evident. Some basic generalisations regarding the planning of education have however been proposed by Todaro (1981), Cohn (1979) and Blaug (1976).

Investment in education then became for many LDCs the largest 'industry' in the country, and the greatest consumer of public revenues. Todaro (1981) reports that the increase in public expenditure on education in the 1960s was proportionately greater than for any other sector of the economy, and that by the mid-1970s, recurrent expenditure on education in many of the Third World nations frequently absorbed between 20 to 30% of the budget. The World Bank Development Report (1980) reports the real extent of this increased expenditure. The total public expenditure on education rose in real terms (in 1976 US $s) from approximately US $9 billion in 1960 (2.4% of their collective GNP) to US $38 billion in 1976 (4% of their GNP). Naturally however, the costs of providing such educational facilities vary widely between regions and the possibilities of continued rapid growth will in large part be dictated by these cost levels.

Table 3.3 Public Expenditures on Elementary and Higher Education Per Student, 1976

Region	Higher (post-secondary) education	Elementary education	Ratio of higher to elementary education
Sub-Saharan Africa	3,819	38	100.5
South Asia	117	13	9.0
East Asia	471	54	8.7
Middle East and North Africa	3,106	181	17.2
Latin America and Caribbean	733	91	8.1
Industrialized	2,278	1,157	2.0
USSR and Eastern Europe	957	539	1.8

Note: Figures shown are averages (weighted by enrolment) of costs (in 1976 dollars) in the countries in each region for which data were available.

(Source: World Development Report;53;1980)

Much of this investment however tended to bypass the primary education level due to the common belief that the money would be more wisely invested in activities that contributed directly to economic growth. Thus planning emphasised the 'manpower requirements' approach which encouraged expenditure in secondary and higher education in the modern sector. People who were engaged in subsistence activities or who worked at various crafts were thought not to require much formal education.

> What society and individuals want of education are often impossible dreams, demands frequently out of line with priorities of national development, indeed, often running against those priorities. These demands sometimes also take the form of political interference in the educational system and distortion of its governing policies. Political pressures intrude at all levels in education, forcing the system to respond, but such pressures may have little to do with primary goals of national development or with real changing needs in society as a whole.

Attempts to expand literacy, increase productivity and increase the number of skilled workers in the country are substantively more complicated than simply providing increased educational facilities. Planners in Third World nations have moreover, to account for the fact that even with existing high levels of demand for education, not all people who are given educational opportunities accept them, and furthermore, that the poor nations are plagued with a very high drop-out rate. Todaro (op cit) estimates that on average 40% of students drop out before even completing the first four-year educational cycle. The position is adequately illustrated by reference to the primary schooling situation in the poor rural north-east region of Brazil. World Bank (47;1980) reports show that although in 1974, an enrolment rate of 46% (less than half the national urban average) was recorded in the area, almost two-thirds of the students had dropped out before the second year. Moreover, it was estimated that at most 4% of the students actually completed the four years, even though the quality of education provided was exceptionally low.

Similar drop-out rates are experienced in Africa and Asia where statistics reveal that on average 54% and 20% of the students respectively, failed to return to complete the four years of primary education. Variations between nations are more extreme than the aggregate dropout rates, with certain African countries recording rates as high as 81% and 64%. (Todaro 1981). The position is much the same for secondary levels of education, which reflect similarly high drop-out rates.

3.11 CONCLUSIONS REGARDING EARLY CONCEPTS OF EDUCATIONAL DEVELOPMENT

The events of the past decade however, have led to considerable revisions of attitude, and while the adequate provision of secondary and higher education remains an important priority, the importance of primary level education in the development process is being increasingly recognized.

Such emphasis on the increased provision of formal educational opportunities between 1960 and 1975 however, resulted in substantial increases in the percentage of the populations of nations in Asia, Africa and Latin America and the Middle East involved in formal education. The World Bank Development Report (1980) estimates the increase as being from approximately 163 million to 370 million in 1975, an average annual increase of 6%. It is reported that the greatest proportionate increases have occurred at the secondary and tertiary levels, with estimated respective increases of 12.7% and 14.5% per annum, as compared with approximately 8% at the primary school level. However, even despite the reduced emphasis placed on lower education in the 1970s, it is nonetheless estimated that primary enrolment accounted for 80% of total LDC enrolments in the mid 1970s. The enrolment figures do however reportedly differ substantially between the different development regions, with Africa lagging behind at all educational levels and having in 1980 only 40% of its primary school-age children actually enrolled. (World Development Report 238:1980).

Rapid expansion of formal education does however, bring with it the necessity to plan, direct, organise and administer the system in such a manner that it makes optimum use of available resources while responding to the requirements of the nation in the most appropriate possible way. However, a lack of pertinent statistical information regarding society's needs, developmental possibilities and the demand for educational facilities effectively thwarted most early attempts at aligning educational planning and administration with the long-term developmental objectives. Todaro (241;1977) puts the position quite succinctly -

The excessively high drop-out rates recorded in the LDCs at the primary level, have in part been a consequence of the over emphasis placed on the expansion of secondary and tertiary schooling, and the relative neglect that lower levels have suffered. As was mentioned previously, this emphasis on secondary school expansion was prevalent in the late 1960s when early theories of the manpower requirements approach to developmental planning were first introduced. In the past decade, however, attitudes have changed quite substantially, and while the adequate provision of secondary and higher education remains an important priority, the value of general education at the primary level has drawn increasing attention. Moreover, the enormous cost differentials between the provision of lower and higher education have frequently pointed to the fact that an educational system stressing above all the expansion of secondary education is possibly providing such opportunities for only the wealthier sector of the population. The result would be an increase in the disparities between wealthy and poorer sectors of the population. It would also necessarily lead to a lower quality primary education being provided due to financial restrictions. The actual extent of such cost differentials becomes evident from Tables 3.4 and 3.5 below:

Table 3.4 : Ratios of Average Annual Earnings of Labour by Educational Level

Groups of countries	Relative earnings		
	Secondary/ primary	Higher/ primary	
USA, Canada, Great Britain	1.4	2.4	Table 3.4 Ratios of average annual earnings of labor by educational level
Malaysia, Ghana, South Korea, Kenya, Uganda, Nigeria, India	2.4	6.4	

(Source: G. Psacharopoulos;1972)

Table 3.5 : Ratios of Total Costs by Educational Level per Student Year

Groups of countries	Relative cost		
	Secondary/ primary	Higher/ primary	
USA, Great Britain, New Zealand	6.6	17.6	Table 3.5 Ratios of total costs by educational level per student year
Malaysia, Ghana, South Korea, Kenya, Uganda, Nigeria, India	11.9	87.9	

(Source: G. Psacharopoulos; 1972)

Table 3.5 reveals the difference in cost ratios in the provision of secondary and primary education to students for one year for a group of developed and LDCs. As is shown in the Table, in the developed nations the ratio of total per pupil costs of secondary to primary education is 6.6 to 1 and that of higher to primary is 17.6 to 1. The cost ratio for the group of LDCs however, reveals the tremendous cost inputs required to provide secondary or higher education in poorer circumstances - the costs reflect that for every one secondary school student educated, an equivalent financial input could have educated 11.9 primary school students. Costs involving the provision of tertiary levels of education are even more alarming; on average 87.9 students could be educated for one year for the same cost as one university student. (Todaro 239;1977). The cost ratio, however, frequently becomes even higher when the situation in some of the poorer African nations, such as Malawi, Tanzania and Sierra Leone is considered individually. In fact, Todaro (op cit) reports that cost ratios per pupil between higher and primary education may actually be as high as 283:1.

Despite the emphasis placed on the unparalleled expansion of secondary education in the LDCs in the 1960s, the situation still existed in the 1970s whereby over 100 primary school pupils were enrolled to every one student receiving higher education. While this situation has of course arisen in part because of the burgeoning population growth experienced in these nations, the conclusion can be reached nonetheless, that the LDCs have tended to apportion a very large fraction of their budget to the very small proportion of the population engaged in higher

education. The relative costs of higher to primary education point quite clearly to the fact that too much has been invested in higher education at the expense of lower levels of education which have already been significantly affected by budgetary cuts due to rising inflation.

This maladjustment in the provision of education becomes increasingly severe when the past provision of rural primary education is considered. Efforts to remedy this situation of inequality led to increased expenditure in this area, and by 1970, primary education in the LDCs was accounting for expenditure of approximately 3.8% of the total GNP of those nations, a sum exceeding US$ 43 billion. Despite the increased expenditure on this area of education, little was in effect done to make the system respond more adequately to the needs and environment of the children in the rural areas particularly. If developmental objectives concerned with a balanced, holistic approach to development are to be actually implemented and achieved, this is definitely an area which could profoundly influence their attainment, for as Todaro (241;1981) points out:

- Over 70% of the children in LDCs live and attend school in rural areas.
- Over 80% of these children are likely to spend their lives earning a living either directly from the land or from unskilled paid employment in rural areas. Yet primary schools spend very little time giving these students the knowledge, skills and new ideas regarding farming practices, nutrition, management, etc. necessary to function efficiently in their rural environment.
- Primary schools typically attempt to prepare student for secondary schools with training in literacy, numeracy and foreign languages receiving highest priorities. The training moreover, usually consists of recitation, repetition, and drill learning, rather than thinking and problem solving.

Clearly, education provided along such lines fails to meet the requirements of the students in the Third World rural context. It is necessary that consideration be given to the importance of integrating school and community life, and ensuring that even children who attend school for one or two years learn something which will be of benefit to them in their daily lives. Such policies will in turn sow significant benefits to the nation building process as a whole.

Such problems of inadequate and inappropriate curriculum content and poor teaching methods are not restricted to the rural primary schools. In fact, as has been mentioned, such a situation is generally found to pervade the entire educational structure, with the secondary and university education frequently being as maladjusted and out of step with the real requirements of the nation, having been similarly modelled along the lines of institutions in the industrialised nations. Once again, emphasis has been on academic excellence, and the training of students to pass qualifying examinations rather than focusing on increasing the individual's ability to contribute to the development of the nation.

If education is to play a significant part in the development process of poor countries, it is essential that policy planning diverges from the emphasis on rapid quantitative expansion of formal education along traditional lines. Basic reform in the curricula at all school levels is essential if the education is to be relevant to the environment in which it exists, while attempts should also be made to modify the conditions of demand and supply of educational opportunities. Such attempts to control and influence the demand and supply of educational opportunities have focused on the concepts of human capital and rates of return analysis.

CHAPTER 4

THE STRUCTURE AND PROVISION OF EDUCATIONAL FACILITIES IN MALAWI

4.0 THE MALAWI EDUCATIONAL SYSTEM AT INDEPENDENCE 1964

As has been pointed out by Seltzer (1965), the existing educational system in Malawi at the time of Independence in 1964 was in a state of disorganisation, reflecting an extremely uneven development and quality. Emphasis had been placed on the rapid increase in enrolments and provision of facilities, but very largely on an unplanned basis, with the result that expenditure at the different educational levels and the provision of facilities reflected gross inequalities and fragmentation within the system.

The provision of adequate schooling facilities had been further complicated by the racial segregation which had been enforced prior to Independence. Much of the schooling available to Malawians had been provided by missionary organisations and voluntary groups. Indeed, publicly funded education was only introduced as late as 1960, and available statistics for 1961 reveal that some 45% of African enrolments were in 'unassisted' privately funded schools. Such privately funded institutions struggled to provide education against tremendous odds; a huge and growing population was becoming increasingly aware of the returns which could be obtained from investment in education, which however, was being funded on the scarcest of resources. As was pointed out in the Phillips Report (1961)

> Many (of the schools) ... scraped out a bare existence in dilapidated buildings, without furniture and equipment, and were entirely dependent on unqualified teachers, many of whom had only had a few years of schooling and were often paid little more than a pittance. Many of these struggled valiantly to provide the education demanded by their people, but the task was generally beyond their power. The result was that the accumulated wastage of human effort and money was tremendous.

With the growing move towards the attainment of Independence however, the availability of high and intermediate level manpower became increasingly under review. The situation indeed seemed critical, with an extreme shortage of skilled Malawians able to take up appointments

in vital government services, let alone in the educational, manufacturing, and service fields. The proceedings of the Addis Ababa Conference of 1961 were receiving increasing attention at this time and pointed to the important role education had to play in long-term national development and economic growth. While the poorer African nations devoted a considerable amount of attention to the purported advantages of such rapid expansion of the educational system, many of the ex-colonies found themselves in situations similar to Malawi; a severe shortage of financial reserves, and the inheritance of a segregated school structure from the colonial period. In such cases, the non-African enrolments at primary and secondary school levels was comparatively high - in Malawi it was recorded at 90%, being distributed between primary and secondary levels on a 6:1 ratio (Seltzer;282;1965). Investment in African enrolment had however been markedly absent during this pre-independence period, with a ratio of 167:1 African pupils between the primary and secondary levels in 1961. The huge discrepancies between educational opportunities is thus evident from Tables 4.1 and 4.2, bearing in mind that the African population was composed of over 4 million persons as compared to approximately 7,500 Europeans at this time. (Malawi Statistical Yearbook, 1979).

Table 4.1 Enrolments, Non-African Schools, Nyasaland, July, 1961

Race	Primary schools	Secondary schools
Europeans:		
Government schools	984	348
Non-government schools	226	57
	1 210	405
Asians:		
Government schools	2 807	274
Non-government schools	109	4
	2 916	278
Coloured:		
Government schools	642	77
Non-government schools	16	3
	658	80
Total in government schools	4 463	699
Total in non-government schools	351	64
Grand total	4 814	763

(Source: Seltzer;280;1965)

Table 4.2 Enrolments, African Schools, Nyasaland, June 30, 1961

School level	School type			
	Unassisted	Assisted	Govern-ment	Total
Junior primary, Standards 1-5	127,734	131,821	1,333	260,888
Senior primary, Standards 6-8	1,429	24,406	115	25,950
Secondary, Forms I-IV	264	1,144	279	1,687
Secondary, Forms V-VI			26	26
Total, all levels	129,427	157,371	1,753	288,551

(Source: Seltzer;282;1965)

These figures reveal that of the already exceptionally low African attendance levels, 90% of such attendance was at junior primary school and less than 0.1% of attendance was in the higher forms of secondary level. In 1961, it is reported (Seltzer 282;1965) that the total number of African pupils enrolled in the final two years of secondary school totalled 26. Naturally then, the number of Malawian students who could possibly receive a university education at this time was incredibly low, reflecting the need for massive restructuring of the educational system and greatly increased financial investment in this social service.

4.1 THE PHILLIPS REPORT - RECOGNITION OF THE NEED FOR A RESTRUCTURING OF THE EDUCATIONAL SYSTEM

Rapid restructuring of the system and greatly increased enrolments at all educational levels, as was encouraged by the Addis Ababa Conference was paradoxically further impeded in Malawi by the shortage of trained or qualified teachers required within the school system. The severity of the situation is reflected in the findings of the Phillips Report (1961) and in Table 4.3.

The Phillips Report reveals that in 1961, approximately 45% of the teachers in Malawi were entirely untrained while only some 6% of the total number of teachers had even completed a secondary school course. Moreover, of those teachers classified as having received some kind of formal training, 60% fell into what was termed the T_5 category, which meant that they had received two years training, but possessed no academic qualifications.

Table 4.3 Teaching-Staff Qualifications, African Schools, Nyasaland, June 30, 1961

Teacher qualification	School level			
	Junior primary	Senior primary	Secondary	Total, all levels
Approved gratudate or equivalent:				
Trained	2	6	38	46
Untrained		1	12	13
	2	7	50	59
Completed secondary school course:				
Trained	15	374	28	417
Untrained	3	10	7	20
	18	384	35	437
Less than secondary school course:				
Trained	3,197	282	3	3,482
Untrained	3,291	11	1	3,306
	6,488	296	4	6,788
Total trained	3,214	662	69	3,945
Total untrained	3,294	25	20	3,339
Grand total	6,508	687	89	7,284

(Source: Ministry of Education, Annual Report for 1961 Nyasaland Protectorate p.14)

The tremendous scope of the problem facing the newly-established Malawi government regarding the provision of education facilities thus became apparent in the light of these revealing statistics. Seltzer (284;1965) summarizes the interrelated areas which would affect future educational planning and programming:

- The necessity of determining how to allocate available resources in a rational way between the primary, secondary, university and adult education levels.
- The importance of bringing about a qualitative improvement in the teaching staff.
- The necessity of implementing curriculum reform in such a way that it links up with socio-economic developments and plans within the nation.
- The determination of ways to ration the limited opportunities for further education among school enrollees.
- How to expand the available resources for investment in education.

4.1.1 The Clarification of Economic and Social Objectives - The Need for Manpower Planning

With issues such as the above in mind, the Malawi government attempted to carry out a number of surveys in the 1960s and 1970s in an effort to determine future requirements of High and Intermediate Level Manpower (HILMP). While the scarcity of statistical information affected the formulation of such surveys, it was also found that the profound and rapid structural changes which were taking place in Malawi after Independence affected the reliability of such surveys for educational planning purposes.

The post-Independence period was significant for the sudden increase in manufacturing undertakings, while development priorities focused on increased numbers of intensive agricultural development projects. Developments in these areas reflected an increasing need for skilled manpower, and it was realised that until clear development policies and long-term plans had been established for the country as a whole, any attempt at educational planning and expansion would be misguided and based on unclear objectives.

The clarification of basic economic and social objectives and the formulation of development plans thus only really permitted a realistic Manpower Survey to be carried out in 1971. Prior to this period, while educational expansion and improvement of facilities had been given considerable attention, any extension of facilities had tended to be somewhat irrational and on a fragmented basis. Thus, while the numbers of skilled manpower was increasing, it was not necessarily linked to the developmental areas which most required human 'investment'. This tended to have a profound impact on the attainment of long-term developmental objectives, but in view of the extremely fragmented nature of the economic, social and political sectors, little else could be done at the time.

As has been stated (Section 2.2) Malawi is essentially without exploitable natural resources. The Statement of Development Policies (1;1971) in explaining the underlying reasons for the development policies, states that "the factors of production with which Malawi is relatively well endowed is land and labour; the factors which are in short supply are

capital and high level skills." Such realisations point to the importance of the development of high and intermediate skills among the population in the stimulation of economic growth and progress, for which purpose national statistics are of course essential.

4.2 THE MANPOWER SURVEYS

The 1965 Manpower Preliminary Survey however, established that the available stock of HILMP was 47,750 persons or 27% of the total number of persons under wage employment. In 1971 the manpower situation as reflected in the Survey appeared quite satisfactory, with an aggregate of 83.2% of the HILMP being Malawian citizens. This percentage did however, tend to overshadow the fact that there were marked variations between the numbers of Malawians employed in the public and private sectors and that a high proportion of Malawians were employed in the lower skilled wage categories.

Nevertheless, the 1971 Manpower Survey revealed, optimistically, that the shortages of HILMP amounted to less than 3% at the time. When projected growth figures were examined however, the real shortage of manpower became more immediately apparent. The 1971 Survey estimated a 20% shortage by 1975, increasing to 35% in 1980, despite planned educational increases and a very conservative approach to localisation of posts then held by expatriate personnel. The importance of this initial Survey thus lay in the fact that it highlighted the tremendous need for increased investment in education if Malawi's future economic growth was not to be retarded by manpower constraints.

4.2.1 Factors Affecting Future Demand for Skilled Manpower in Malawi

The concomitant increased demand for skilled manpower in line with economic growth, is thus estimated by the 1971 Manpower Survey to be affected by changes in five different structural areas.

4.2.1.1 Economic Growth

The rate of economic growth and progress will be the most significant factor determining any rise in demand for HILMP. Indeed, the importance of the role of HILMP in the economic growth process is stressed by

the acknowledgement that a positive functional relationship has been recorded between HILMP and monetary GDP.

4.2.1.2 Wastage

This is a factor which must be taken into account when assessing any future manpower requirements, and refers to the numbers of persons who are likely to withdraw from the labour market each year due to retirement, disability or death. The 1971 Survey stated that wastage was however, unlikely to be a significant issue affecting future manpower demands for the next few decades in view of the fact that the population at large, and in particular the working population in the HILMP categories tended to be heavily skewed towards the lower age brackets.

4.2.1.3 Utilization

In view of the fact that the provision of educational facilities demands considerable investment and expenditure by the government, effective utilization of trained manpower is essential. If available manpower is to be utilized to the most effective extent it is necessary that the availability and provision of educational opportunities must be closely linked to the vacancies existing in the labour market. This is dependent on well formulated and co-ordinated development plans in all sectors.

4.2.1.4 Wage and Salary Structure

The Wage and Salary structure, and the introduction of a Wages and Salaries Policy will have an important effect on manpower demand and supply since variation in salaries will affect the private rates of return to the individual and hence influence the demands for various types of educational training.

In the Third World situation however, the payment of significantly higher salaries to HILMP, while encouraging private investment in such education, can in the long term have an adverse effect on employment levels. The primary reason for this is that substantial increases in wages necessarily limit the numbers that can be employed in a situation

where financial restrictions are severe. In Malawi's instance, such a situation has been overcome by the introduction of the Wages and Salaries Policy by which means the Government established minimum and maximum salaries payable for each occupational category. However, it is essential if such a Wages and Salaries Policy is to be fully successful, that the Policy be flexible enough to permit changes to be made in the salaries to reflect the varying levels of demand. Such changes in salary levels would thus necessarily have to be made on the basis of very timely and accurate manpower forecasting techniques. The difficulty of collecting reliable statistical information from this sector tends to jeopardize the reliability of this system of influencing the demand and supply of trained manpower.

4.2.1.5 Localisation

The demand for trained HILMP within Malawi will be further influenced by the degree to which Malawi pursues its policy of localisation. Until the present time this move towards localisation has of necessity been pragmatic and slow, due largely to the shortage of available financial resources for investment in tertiary education and also the requirement that reasonable levels of efficiency be maintained in the move towards economic self-sufficiency. The localisation policy thus states specifically that jobs will not be 'localised' until such time as it results in no loss of efficiency. Such pragmatism is largely dictated by the shortage of locally trained skilled personnel. In the U.S. AID (No. AID/AFR-C-1132) report of 1979 it is stated that the number of skilled managers is insufficient even for the requirements of key governmental posts,while parastatal organisations and private industries experience severe manpower shortages.

4.2.2 The Findings of the Manpower Plan of 1971

The manpower situation thus remains severe despite the seemingly optimistic findings of the 1971 Manpower Survey (17;1980) reporting that:

- There existed in 1971/2 an overall localisation factor of 83.2% of all HILMP.

- The Public sector was the larger employer of HILMP, employing in 1971 25,800 persons or 54% of the total HILMP, which, while being a typical situation in many LDCs, is also to be expected in view of the relative sizes of the public and private sectors.
- And thirdly, it is stated, somewhat less optimistically, that the non-Malawian component of HILMP was heavily concentrated in the private sector and dominated the senior level categories.

The statistics reveal that in the public sector the percentage of Malawians occupying senior posts is only 37.4% while the alarming figure of 13.8% represents those Malawians occupying high level manpower positions in the private sector, showing the drastic need for increased training and localisation of personnel at these levels. The situation becomes more promising at the intermediate skill level (where 94.4% of the public sector and 50.3% of the private sector is Malawianised) and at the skilled level (98.7% of the public sector and 76.5% of the private sector being localised). (Manpower Survey;11;1980). The 1971 Survey (12;1980) pointed out moreover, interesting ratio patterns as concerned relative HILMP density patterns in the public and private sectors - approximately 1:2 between the public and private sectors at the senior level; 3:1 at the intermediate level; and 1:1,2 at the skilled level. The shortages in the private sector levels appear to be largely in fields requiring scientific, technical and commercial qualifications and of course, such factors point out the need for educational planning to overcome any such shortages.

4.3 MANPOWER POLICIES AND THE "LOCALISATION" OF HILMP POSTS

Growth and development both in the public and private sectors throughout the early 1970s resulted in increasing requirements for HILMP with the result that the percentage of localisation of posts in both sectors declined. Hence the situation reported in the U.S. AID Report (op cit) where even the public sector was unable to fill its senior positions with Malawians.

Hence, it was appreciated that there would, in the 1980s, be an increased reliance on expatriate personnel in line with the increased economic expansion, although such reliance would be on increasingly specialised skills. The rationale for pragmatic localisation is thus expressed in the 1971 Manpower Survey (18;1980) -

> Associated with the introduction of new industries and the changing pattern and composition of production and output, is the demand for new (and locally unfamiliar) skills which would require additional retraining and experience. In this context therefore, it must be emphasised that the overall number of non-Malawians employed at any time is less significant than the percentage both in aggregate terms and in given occupational categories.

4.3.1 The Reliance on Expatriate Personnel

The localisation situation is however, furthermore complicated by the fact that many of the private Enterprises are multinational concerns (Section 2.5.1) which have traditionally relied upon expatriate personnel and have, until recently, not pursued any policy of localisation nor introduced many on-the-job training schemes. The position is particularly marked at managerial and senior executive level. This situation is common to many LDCs where private industry is mostly undertaken by foreign organisations, and the severity of the situation in Malawi is reflected in Table 4.4. Nevertheless, even with the reliance on expatriate personnel, HILMP shortages remain acute, particularly at the higher levels. The 1971 Manpower Survey (15;1980) reports percentage vacancies of 4.5% at the senior level; 2.5% at the intermediate level; and 2.1% at the skilled level. The situation was not substantially improved in 1980, as would appear from the 1981 Statement of Development Policies.

In an attempt to accelerate localisation in private industry the Government of Malawi established the Manpower Assessment and Utilization unit, its main function being to develop a data collection system which would assist in the formation of a structured program of localisation across all posts in the nation.

Table 4.4 HILMP CITIZENSHIP OCCUPATIONAL DISTRIBUTION

OCCUPATIONAL CATEGORY	TOTAL		MALAWIANS		NON-CITIZEN EUROPEANS		NON-CITIZEN AFRICANS		NON-CITIZEN ASIANS	
	Number	%	Number	%	Number	%	Number	%	Number	%
1 and 3 Senior Category	1,706	3.6	382	1.0	1,203	20,1	14	3.3	107	6.7
2 and 4 Intermediate Category	14,858	31.1	12,392	31.1	1,509	25.2	25	5.8	932	57.9
5, 6 and 7 Skilled Category	31,186	65.3	26,962	67.9	3,265	54.7	389	90.9	569	35.4
ALL CATEGORIES	47,750	100.0	39,736	100.00	5,978	100.0	428	100.0	1,608	100.0

(Source: Manpower Survey 1971 pg 12a; 1980).

This pragmatic approach to localisation adopted by Malawi has however, been on occasions unnecessarily slow since expatriate positions have frequently taken on a 'permanent' aspect while time in the job position has frequently been, somewhat incorrectly equated with ability and performance. Unnecessarily slow progress towards localisation occurs at considerable financial cost to Malawi; expatriates must be paid internationally competitive salaries, most of which are transferred out of the country, while their capital investment in the country tends to be minimal.

It is difficult to estimate across professions the appropriate period of on-the-job training, and while some on-the-job training has been far too prolonged, there are also indications that the swing the other way has resulted in rather high expectations of newly qualified personnel. An over-rapid rate of localisation can in turn be extremely expensive for the country due to the possible adverse effects it may have on economic expansion.

4.3.2 Strategies Introduced to Accelerate Localisation

As the U.S. AID Report (No. AID/AFR-C-1132;92;1979) points out:

> it can be seen that the problem of localisation is much more complex than the 'current and projected ratio' of Malawians to expatriates - some expatriates would be required for a long period of time even with an identified Malawian counterpart being properly trained. This means that manpower projections must take both expatriates and Malawians into account - since often the local is not directly or immediately a substitute for the expatriate.

Attempts are being made however, to overcome the problems associated with localisation with the new requirements by the Manpower Assessment and Utilisation Unit in 1980, that an advance plan for localisation of the job be presented with each application for a Work Permit for expatriate personnel. Moreover, consideration is also being given to the standards and qualifications traditionally required for various positions. Suggestions are being considered that Malawi follow Tanzania and China's example in relaxing standards of personnel where there exist no safety hazards or possibilities of serious long-term errors. Such a move could not only substantially reduce the costs of manpower training, but also hasten the move to 'localisation' of job positions.

The move towards localisation has also been accelerated to some extent through the introduction of a system of 'fragmentation' of high level occupations. Several Malawians with intermediate or lower level training are substituted for one expatriate position, thus splitting responsibilities and tasks among them. While such a move has obvious benefits in certain circumstances, it is important that such 'fragmentation' be introduced only on a restricted basis - there are for example certain occupations where this approach would be detrimental to the satisfactory attainment of the task, as for instance in the more practical occupations of engineering, mechanics, etc. In addition, this practice will also be likely to stifle innovation and inhibit the introduction of new technology. A policy of 'substitution' has been implemented at the intermediate and lower skill levels, but this is clearly not feasible at the senior levels where shortages of accountants, engineers, electricians and doctors were reported. Indeed, shortages in these spheres have become so severe that some organisations have reported this lack of trained manpower to be a major factor impeding expansion, an issue which clearly has important implications for the attainment of Malawi's future development objectives. It is also pertinent to note that it is exactly these high level occupational skills that are scarce in Malawi that are also in short supply in the international labour market, and which demand the highest and most competitive salaries, thus placing a considerable financial burden on Malawi for their recruitment. It is notable that these occupations have the longest gestation period and rely on a maths/science grounding at the secondary education level, which, to the present time in Malawi has been totally unsuited to the training of students in these fields. Financial restraints are moreover, likely to hinder any positive attempt at substantial expansion of educational facilities in these fields. The solution in the short-term lies in increased reliance on non-formal education, but as yet little if any positive action has been taken in this direction.

4.3.3 Shortages of Malawian Manpower Training Facilities

The high cost to Malawi of relying on expatriate personnel has been increased by the fact that much of the training of Malawian replacements for these positions has had to be undertaken in overseas

institutions as no suitable educational facilities exist in Malawi. Apart from the possibilities of 'brain drain' which such external training gives rise to, the dependency on expatriate personnel and overseas training clearly has a severe impact on Malawi's balance of payments. If personnel could be locally trained and the reliance on expatriates reduced, the flow of currency out of Malawi could be substantially reduced and the funds channelled into other developmental priorities. Such factors thus point to the great importance of rationally determining future manpower requirements in line with planned economic growth and improving the structure and organisation of educational facilities accordingly.

4.4 THE FORMULATION OF POLICY OPTIONS TO ENSURE AN ADEQUATE HILMP SUPPLY

In view of the scarcity of suitably qualified manpower at all occupational levels therefore, there is an obvious need for expansion of educational facilities in the nation to meet such manpower shortages as are likely to occur in the pursuit of developmental objectives. Financial restrictions demand careful analysis of the areas where such expansion should be directed and where returns to investment will be greatest. Such a factor was clearly recognised as a result of the 1971 Manpower Survey (34;1980):

> The paucity of resources dictates a rational choice between education as an end in itself (consumption) and as a means to an end (investment). In Malawi's circumstances, the main functions of the educational system must be to provide the work force with the abilities required for productive activity.

To such ends the 1971 Survey (op cit) put forward a number of complementary policy options with the purpose of ensuring the formation of an adequate HILMP supply:-

a) The expansion of higher (tertiary) educational facilities concerned with the training of personnel in the areas where critical shortages were being experienced, for example, in engineering and accountancy and in those professions related to the construction industries.

b) The expansion of secondary education facilities, particularly in the fields of science and mathematics, which are subjects essential as a foundation for education in the scarce skills at the tertiary

level, and which would also result in personnel qualified to meet requirements for technical skills.

c) An important emphasis was to be placed on the expansion of facilities and improvement in the quality of education at the upper primary school level. It was proposed that attention at this educational level be focused on basic literacy and numeracy and on practical agricultural skills in line with the importance placed on agricultural output by the development objectives. Elementary skills in home economics and building was also stressed. It was hoped that the primary level of education, if structured in such a way, would equip the large number of primary school leavers to enter the labour force or engage in the agricultural sector without further formal education, while the small minority who continue to secondary education would have received a better grounding.

d) In line with improvements and expansion of educational facilities, the need for improved procedures for selecting candidates to advance to secondary and tertiary education were called for. Moreover, the need for flexibility in the Wages and Salaries Policy was recognised, in order that rates of pay could be adjusted to reflect relative skill scarcities, the assumption being that this would encourage individuals to follow those careers which would be of greatest benefit to the economy.

e) The continued recruitment of expatriate personnel as a means of filling critical HILMP vacancies while such personnel could also assist in on-the-job training for Malawians. In accordance with localisation policies however, such recruitment would have to be undertaken in order to fill only vacancies for specialised skills for which no Malawians were available.

Within such broad policy objectives as those stated above, it becomes necessary to formulate more detailed educational plans which should be closely co-ordinated with the overall developmental objectives. Hence it is interesting to examine more closely the actual structure of the educational system and the facilities and opportunities provided at all levels, so that it might be assessed as to how closely such a structure achieves the demands made on the educational system.

4.5 THE STRUCTURE OF THE MALAWIAN EDUCATIONAL SYSTEM

The educational system of Malawi is essentially based on a three tier system of primary, secondary and tertiary institutions, with additional educational facilities being provided in the form of Teacher Training Colleges and a Correspondence School. The structure of the system is illustrated in Figure 4.1.

The primary aim of the educational system as a whole, in line with the policy options discussed in Section 4.4, has been "not to produce academics, but to train men and women who can work constructively with their hands and bodies as well as with their minds...The major factors in the country's educational plans therefore, are economic and human resources." (Ten Years of Development and Progress;1;1976). Consequently, the educational system, based on the three tier system has, to a considerable extent been linked to national economic objectives although severe financial restraints have curtailed expansionary measures. According to the Report of the Ministry of Education (op cit), in 1976 only approximately 46% of the school age population could possibly be accommodated at the existing school facilities, while a mere 15.7% of those pupils completing primary education could be accommodated in secondary schools. The 1977 statistics reveal the numbers of Malawians who had attended school at some level as is shown in Table 4.5.

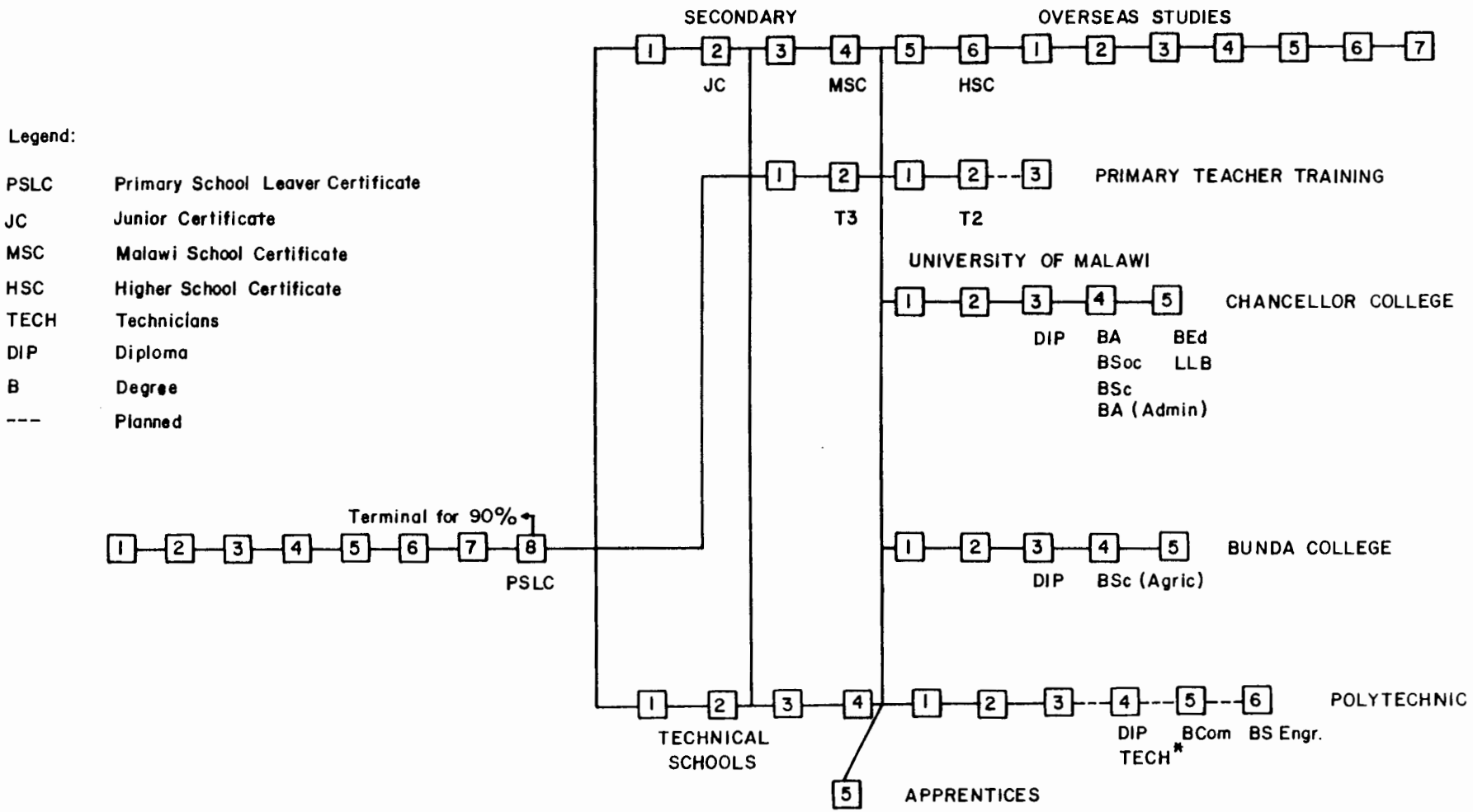
Table 4.5 African Population 5 Years and Over by Whether They Had Attended School, 1977

Region	Total	Had Attended School		Standard 8 or Higher		University	
		Total	Percent	Total	Percent	Total	Percent
Northern	526,787	339,074	64.4	55,303	10.5	359	0.1
Central	1,706,470	756,772	44.3	94,755	5.6	1,118	0.1
Southern	2,220,789	908.350	40.9	135,791	6.1	1,964	0.1
Total	4,454,046	2,004,196	45.0	285,849	6.4	3,441	0.1

(Source: Population Census, 1977)

While these statistics are alarmingly low, as has been pointed out in Chapter 3, unqualified expansion of educational facilities without sufficient attention being given to available job opportunities for

FIG. 4.1 MALAWI: PLANNED STRUCTURE OF EDUCATIONAL SYSTEM, 1978



Note: ☐ refers to number of years

*Extra year because of 'sandwich' program with industry

(Source: U.S. AID Report (NO. AID/AFR-D-1132; Appendix; 1979)

school leavers, can be counterproductive, causing ~~underemployment~~, unemployment and urban migration in addition to the consequent social problems. The expansion of educational opportunities must consequently be closely allied with moves to increase economic growth and development.

4.5.1 Primary School Development and Expansion

Expansion of primary education facilities has however, received considerable impetus in the later 1970s. Such expansion is reflected in the following statistics (cited in 10 Years of Development and Progress; 1;1976) - In 1965/66 there were 5,945 Primary teachers instructing 286,056 pupils in primary schools. By 1975/76 however, there were increases of 180% to 10.588 teachers teaching 641,709 pupils. These increases in enrolment continued into the 1978/79 academic year with 705,956 registered pupils, an increase of over 4.5% for the 1977/78 figures. The total expansion in enrolments at this level is reflected in Table 4.6.

Table 4.6 Total Enrolment by Standard in Primary Schools 1973/74 - 1978/79

Standard	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
1	171,989	190,286	188,424	189,980	180,524	201,715
2	110,380	119,471	125,300	122,332	118,245	120,732
3	80,037	94,903	98,484	101,411	100,694	98,287
4	52,445	64,174	72,138	75,664	76,0 0	77,002
5	37,282	44,409	51,094	58,166	62,400	61,446
6	30,171	32,842	35,949	44,486	47,388	52,771
7	24,177	27,643	28,786	33,127	36,934	39,778
8	30,820	37,950	41,534	47,774	52,047	54,195
Total	537,301	611,678	644,709	663,940	675,740	705,956
Assisted	481,461	549,245	576,377	623,592	605,733	635,678
Unassisted	55,840	62,433	65,332	40,348	70,007	70,278

(Source: Economic Report; 51;1980)

Not all these pupils were candidates sitting for the Primary School Leaving Certificate Examination - 38,003 students are recorded in 1975

as having written the examination. Of the remaining students, many did not get past the first two years of education. Moreover, of the total of recorded teachers at this level, 1,047 were listed as being unqualified.

Attempts were made nonetheless, to continue increasing pupil enrolments, particularly at the higher levels, and to provide schools for rural areas on a self-help basis with government assistance. Primary schools thus totalled 1,552 in October 1975. It is pertinent however, to question to what extent the expansion of government funded primary educational facilities has in fact kept pace with the rate of population expansion. In this regard Williams (287;1978) reports that

> although wastage rates in the primary schools have been reduced, the numbers enrolled in the first few standards fell sharply in the first half of the sixties, and in spite of an upswing ... total enrolment in the primary schools was lower in absolute terms in 1970 than it had been in 1963. The school-age population was increasing rapidly during this period - perhaps by more than 3% per annum - so that the proportion of school-age children actually attending school may well have fallen by nearly 30% during the decade ... There has been a big increase in enrolment during the 1970s, but a considerable part of that has simply made up ground lost since independence.

Unassisted schools, totalling 588 at this period, were provided by voluntary organisations although receiving no government assistance on the grounds of low enrolment and inadequate tuition facilities. Such institutions have continued to provide an important source of education where a heavy demand exists, particularly in the rural areas.

Such continued expansion of primary education facilities is in line not only with the rapid population growth which Malawi is experiencing but also with the emphasis being placed on agricultural growth and development. In view of the fact that approximately 90% of the pupils will go no further than elementary education, and will return to smallholder agricultural units, emphasis in the curriculum has been placed on agriculture and associated subjects.

As has been stated in the U.S. AID Report (No. AID/AFR-C-1132; H-1; 1979):

> the primary school curriculum has been especially tailored for the primary school leaver - to make them better farmers, to understand the principles of farm management, economics, hygiene and those basics directly related to improving one's lot in living off the land ... Agriculture must be recognised by the pupils as the most important practical science by the integration of all relevant principles from subjects such as biology, geography, physics, etc., and its relationship to home economics, housecraft and health science.

The inclusion of agriculture into the school curriculum was first undertaken in 1969, but due to a lack of teachers qualified to instruct on this basis, the program only really began to get underway in the mid-1970s, when more highly qualified teachers were produced. Training in the agricultural spheres for more established teachers has been achieved primarily by means of week-long in-service courses while great efforts by the Ministry of Education have been made to ensure the adequate provision of seed, fertilizers and farm implements to schools to enable practical demonstrations in classes.

Emphasis on this sphere is justified by the fact that any prospects of rapid economic growth are reliant on a concomitant rise in agricultural production, which in Malawi's instance can best be achieved through increasing the small-holder production. Basic education in agricultural techniques and related subjects will mean that school leavers will return to their communities better equipped to understand their rural problems, and to take an active part in rural development. At the present time, such an approach to primary education curricula would seem well suited to development needs and requirements. Continuing assessment of the adequacy of such an approach would need to be carried out however, in view of the negative experiences of some nations, (notably Ghana (Section 6.2.1)). It may well be the case that expansion of industrial, urbanised areas is as important in certain circumstances as continued emphasis on small-scale agricultural productivity.

Future development plans thus place a continuing emphasis on the expansion of primary education opportunities, with the goal for 1982 being an attendance at this level of schooling of 50% of the appropriate age group. (U.S. AID Report, No. AID/AFR-C.1132;piv-14;1979). Naturally, the

extension of facilities must be met by an improvement in teaching standards, and this move is reflected in the establishment of three new Teacher Training Colleges. In addition, efforts have been made to expand the provision of school equipment and textbooks, which are at the present time in alarmingly short supply. It is for instance, not unusual for a class of over 60 pupils to have access to only one textbook, that being the teacher's copy.

Continued expansion of this level of education is then restricted to some degree by the shortage of equipment and appropriately trained teaching staff. Such expansionary measures must, however, continue to be carefully aligned to small-holder agricultural development to encourage progress in this sphere, and if secondary level education is to expand at a similar rate, provide increased opportunities for tuition at this level.

4.5.2 Secondary School Development and Expansion

In contrast to primary education, where the aim is to equip the students to deal with their rural environment, the overriding aim of secondary school education in Malawi is to increase the numbers of school leavers qualified to fill the increasing numbers of posts in the public and private sector, and for further training to fill posts in the growing industrial areas.

Government policy in attempting to achieve this aim, set the goal of providing a Day Secondary School for each administrative district, a task that was achieved in 1976. This meant, according to the 1980 Economic Report, that there existed a total of 61 secondary schools in the country at that time, not all of which however, received government funding. The distribution of these schools was as follows:

Government Boarding Secondary Schools	4
Government Day Secondary Schools	27
Assisted Boarding Secondary Schools	18
Assisted Day Secondary Schools	1
Unassisted Boarding Secondary Schools	6
Unassisted Day Secondary Schools	5

(Source: Economic Report 1980)

The provision and assistance given to these various secondary schools has considerable import for the overall increase in numbers of pupils attending this level of education, which at present can accommodate only 10 to 15% of primary school leavers. The provision of boarding facilities is of particular importance, for many students come from rural areas which are a considerable distance from schooling facilities, and would otherwise be unable to attend regularly without this facility. Moreover, the existence of boarding facilities also generally means that the students receive adequate meals, lighting and library facilities, the absence of which in their homes seriously impedes their studies. Such assumptions regarding the important role boarding schools play in improving the overall quality of secondary school education, are supported by the fact that boarding school pupils have in the past achieved higher scores in the Malawi Certificate Examination. In view of such factors the Government moved to increase the capacities in these schools to approximately 1800 students by 1979, a figure which has however proved rather too ambitious in the face of financial restrictions.

Nonetheless, available statistics would indicate a considerable increase in the overall number of pupils attending secondary school. In 1965/66, just after Independence, there were a total of 6539 students at secondary schools with 219 secondary teachers. Enrolments in the 1975/76 academic year had increased substantially with 14 489 pupils and 748 teachers recorded at this level, as is revealed in Table 4.7:

Table 4.7 Enrolment by Form in Secondary Schools 1973/74-1978/79

Form	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
1	4,175	4,105	4,404	4,478	4,690	4,854
2	4,086	4,243	4,325	4,480	4,480	4,570
3	2,817	2,725	2,953	2,913	3,023	3,144
4	2,650	2,770	2,721	3,017	2,886	2,932
Total	13,723	13,843	14,403	14,774	15,079	15,500
5	24	35	29	16	29	30
6	27	22	19	36	32	29
Total	51	57	48	52	61	59
Secondary School GRAND TOTAL	13,779	13,900	14,451	14,826	15,140	15,559

(Source: Malawi: Statistical Yearbook;34;2979).

While such statistics give the impression of considerable increases in the provision of facilities at this level, they tend to be deceptive for a number of reasons. The statistics fail to point out that with the exceptionaly rapid increase in population (an estimated 2.9%) the actual proportion of the youth receiving secondary education has declined despite the increase in total numbers at secondary schools, in the same way that the proportion of children receiving primary education has declined. (Section 4.5.1.). Furthermore, there is growing concern regarding the quality of education being provided; the Polytechnic and other higher educational facilities are finding the need to include increasing amounts of remedial work in their courses given during the first academic year, while similar complaints are being made by employers in the private sector.

Attention concerning these low standards has tended to focus largely on the fact that most secondary schools provide for only four years of education, that is, up to the equivalent of the British 'O' level which internationally is not generally regarded as adequate for entrance to higher education facilities. Attempts are being made to introduce an additional two years of study at the secondary level, to raise the standard to an equivalent of the British 'A' level. However, to date due to the costs incurred by such a move, only one school has extended its facilities to meet the 'A' level requirements. Considerable debate has arisen as to whether this step will in fact result in significant improvements, particularly in view of the fact that Zambia experimented with such expansion, only to drop the proposal in the face of inadequate improvements in quality. There was moreover, growing evidence that secondary school examinations, following the curriculum of the British 'O' and 'A' level system were not appropriate to the developmental requirements of the nation.

In the case of Malawi, while extension of the secondary schooling system is still favoured, the recognition of the inadequacy of the British-based educational curriculum in the 1970s led to policy moves to ensure that secondary education was more fully relevant to Malawi's requirements. To this end, the Malawi Certificate of Education examination was introduced to replace the traditional 'O' level. It was stated by the Ministry of Education (10 Years of Development and Progress, 6;1976) that

> It was necessary that the contents of the syllabuses for the new exams be geared to serving the local needs and meeting the country's development requirements. The Malawi Certificate of Education examination was then so structured as to portray the national aspirations both in content and approach."

Such moves were in line with the revisions undertaken in the primary school curricula, (Section 4.5.1) and increasing emphasis was placed on tuition in subjects related to agricultural development priorities, while notice was also taken of the results of the manpower analysis of 1971 reflecting the need for increased emphasis on scientific and mathematical subjects.

Attempts to make the curricula more appropriate to Malawi's developmental needs and to establish the Malawi Certificate Examination Board were supported by aid from the British Overseas Development Ministry. Teachers, assistants and examiners of the Malawi Certificate examination attended yearly courses in the United Kingdom under the supervision of the Associated Examining Board in order to set standards and receive assistance in the administration of such examinations, ensuring that the introduction of such local tests might not lead to a lowering of the quality of education.

The quality of the education provided does depend in large part on the standard of teaching. The provision of Secondary education, even more so than primary education, has in the past been severely retarded by the shortage of suitably qualified teachers. This situation is reflected in Table 4.8. This shortage has led to some reliance on expatriate personnel, at great expense to the Government, since their salaries could not be kept within the Wages and Salaries Policy constraints. Expatriate personnel are moreover, frequently not aware of the educational requirements of the nation with the result that difficulties have been encountered in pursuing the revised curricula to meet the Malawi Certificate standards. The Government of Malawi, acutely aware of such difficulties has since 1974, undertaken to expand the teacher training facilities for secondary school teachers at the University of Malawi in the hope that the result would be increased numbers of qualified candidates admissable to the University. The projected figures of the outputs of secondary schools up to 1990, as presented in Table 4.9 however, reveal only a very marginal increase in output at this level.

TABLE 4.8 ALL SECONDARY SCHOOLS: NUMBER OF INSTITUTIONS, NUMBER OF CLASSES AND EDUCATION STAFF, 1978/79

Type of Schools	Number of Schools	Number of Classes	Graduates			Diplomates			T2/T3[1] or Other Qualifications	Total
			Expatriates	Local	Total	Expatriates	Local	Total		
Day Schools										
Government	27	193	26	86	112	4	173	177	30	319
Government Aided	1	12	6	2	8	1	13	14	2	24
Total Day	28	205	32	88	120	5	186	191	32	343
Boarding Schools										
Government	4	48	9	26	35	-	47	47	5	87
Government Aided	18	131	65	42	107	12	84	96	23	226
Total Boarding	22	179	74	68	142	12	131	143	28	313
Total assisted Schools	50	384	106	156	262	17	317	334	60	656
Total unassisted	12	82	58	17	75	25	22	47	15	137
Grand Total	62	466	164	173	337	42	339	381	75	793

(1) All local staff.

(Source: Malawi Statistical Yearbook; 40; 1979)

Thus, despite such attempts to improve the quality and relevance of secondary school education in Malawi there exists undoubtedly the need for continued rapid expansion of this level of schooling. With the pursuit of the development plans, any projected increase in agricultural output, and concurrent expansion of industrial activity as, is an integral part of the development policies (Section 2.3.1 and Section 2.5), will give rise to an increased demand for skilled and trained manpower within the nation, and hence the need for more secondary school graduates. While such factors have been noted by the Ministry of Education, surveys carried out by the U.S. AID projects (No. AID/AFR-C-1132;1979) reveal that institutions of higher education and private industries feared that rapid expansion at this level might work against the quality of schooling for the following reasons:

- Entry standards to secondary schools might have to be lowered to achieve the desired intake
- Any such expansion could well result in the recruitment of poorly qualified or unqualified teachers in view of the prevailing shortage of qualified staff
- The establishment of new schools could well occur slowly due to financial restraints, with the result that overcrowding of classes would occur, thus having an adverse effect upon educational standards.

Thus, in addition to the shortage of secondary school leavers, there exists considerable concern over the low quality of education being attained. Clearly, if developmental objectives are to be achieved, the existence of a competent and skilled reserve of human capital is essential. The shortages and low quality of these school leavers must be overcome; a situation which would obviously necessitate considerable expenditure on the part of the government. In view of the declining growth rate of the 1980s, and decrease in expendible GNP, the government is however severely restricted in any such expenditure. Indeed, education has been accorded a reduced percentage of the budget in the 1980s, (as evidenced in Figure 2.1). Such a move will clearly have profound and adverse effects on the long-term development potential of the nation. Attempts to date to short-circuit this situation have focused on the establishment of a Vocational Guidance Program and the establishment of the Malawi Correspondence College.

Table 4.9

OUTPUTS OF SECONDARY SCHOOLS -- 1972-1990

(Ministry of Education data)

YEAR	NUMBER ENTERED (rounded)	NUMBER PASSED (rounded)	PERCENT PASSED[a] (rounded)	POLYTECHNIC DEMAND[d] (per year)	REMARKS
1972	2,000	1,275	63		The first year that the Malawi School Certificate of Education (MCE) was issued.
1973	2,400	1,350	56		
1974	2,500	1,350	55		
1975	2,600	1,600	68		
1976	2,500	1,600	65		
1977	2,650	1,650	62		
1978	2,650	1,650	62	91	
1979	2,900	1,750[b]	60	166	Assumed 60% - conservative
1980	2,900	1,750	60	250	Assumed 60% - conservative
1981	3,000	1,800	60	325	Assumed 60% - conservative
1985[c]	4,350	2,800	65	350	Assumed 65% - since increase in capacity is in boarding schools.
1990[c]	4,350	3,150	70	350	Full impact felt of primary and secondary teacher upgrading. IDA III program may also be complete (further upgrading of primary schools).

[a]Average number of students passing 1972-1978 about 60%.

[b]Assumes International Development Association II program outputs of about 1,750/year added (all boarding school expansion).

[c]Data obtained from Ministry of Education.

[d]For degree/diploma program, expanded program.

(Source: U.S. AID Report (AID/AFR-C-1132;pp iv-22;1979)

4.5.3 The Vocational Guidance Programme

The basic objective of this programme has been to assist students at the secondary school level to make realistic career decisions which at the same time are in tune with the developmental priorities of the nation, thus resulting in the greatest social rate of return for the financial investment which has been incurred by the nation. To this end, the Ministry of Education has appointed a Career Councillor at each government and government-aided secondary school to assist in disseminating information on available post-school training and educational opportunities, and on existing vacancies in the private and public sectors. The introduction of vocational guidance programmes has been associated with a considerable measure of success in England and America particularly, in informing students of future job opportunities and areas of the job market where shortages of skilled personnel are most prevalent. The approach has also been recommended as one means of combating the rising levels of the educated unemployed found in nations such as India, Argentina and the Phillipines. (Blaug 234;1976). It is thus hoped that in Malawi such a scheme, while incurring relatively small financial outputs, will assist in channelling student interests into those vocational areas in which the country is experiencing shortages.

4.5.4 The Malawi Correspondence College and Broadcasting Unit

Faced with the need for rapid quantitative expansion of secondary school educational facilities, and in view of the severely restrictive financial framework within which the Ministry of Education was forced to operate, the Malawi Correspondence College and Broadcasting Unit was established. The principal objective of this government funded unit, was to provide opportunities for further study for those students who had completed primary school, but had not been able to gain a place at a regular secondary school, or for those students who lived in rural areas and had no access to further education.

Attempts have been made to ally the Correspondence College as closely as possible with the formal educational system in order that students might sit for the Malawi Certificate of Education or take any of the ten school subjects normally offered for the first two years of secondary school. Moreover, provision has been made, where possible, for students of school-going age who do well in their correspondence

courses, to be absorbed into the formal school system as vacancies occur. Following the guidelines for such programmes laid down by the World Bank Survey of 1965.,(Economics of Education Radio Report, World Bank; Oct. 1980), night secondary schools, supplied with radios, have been established in 91 centres throughout the country, in order to further extend the project.

Such a scheme has great significance for the furthering of educational opportunities in Malawi while making very limited demands on the educational budget. The success of the project is evident from the enrolment figure in 1976 of 3,600 and the increasing numbers of these students who are becoming eligible to write the Malawi Certificate of Education examination.

4.5.5. The Development of Tertiary Education in Malawi - the University

> Those countries in Middle Africa that did not have a university before independence, soon became committed to the establishment of one. The university became the symbol of independence no less than the flag, the national anthem, or the aeroplane. Africa firmly accepted the belief that the university was a vital institution for the sustenance of independence and development. The legitimacy of the university as part of the national apparatus could no longer be questioned. (Porter;26;1973).

Malawi was indeed no exception to the rule in the middle African countries in the rush to establish a university with the granting of Independence. Indeed, the Act providing for the establishment of the university was passed in October 1964, with the first students being admitted in 1965. Temporary use was made of secondary schools in Blantyre until such time as a new campus was established at Zomba, incurring considerable expenditure on the part of the Government.

The development of the university facilities in Malawi has however generally been undertaken at a somewhat more pragmatic and slower pace than in most other African nations, largely as a result of the limited financial reserves available for expenditure in this direction. Expansion of tertiary education has been tied to the provision of a series of grants by U.S. AID over the years. The initial grant of US $3.1 million

in 1962 was given for the establishment of the Polytechnic buildings in Blantyre. The second grant of U.S. $1.1 million, made in 1975, permitted the expansion and improvement of the Bunda College of Agricultural Research and Extension Project in the Government's National Rural Development Programme. The most recent grant of U.S. $8 million was obtained in 1980 for extensions and additions to the Polytechnic to meet further requirements. (Action Memorandum;17;1980). Expenditure by the government on tertiary education facilities has therefore been kept relatively low, although, due to grants-in-aid, enrolments at these institutions have increased, if somewhat slowly (statistics reveal an increase of 0.1% to 0.3% of the population attending the university during the period 1971 to 1977 (Malawi Population census 1980)). However, a significant increase in enrolments of 20% has been recorded by the 1980 Economic Report for the 1977-79 academic years. (Table 4.10)

Table 4.10 University of Malawi: Number of Students by College and Course

College	Course	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
Chancellor College	Degree and Diploma	582	692	599	600	598	690
Bunda College	Diploma and Degree in Agriculture	205	223	226	236	236	373
Polytechnic	Technical and Business	299	313	323	319	319	323
Total	All Courses	1,086	1,228	1,148	1,155	1,153	1,386

(Source: Economic Report;53;1980)

Some tertiary education has however been undertaken by students at overseas universities in those disciplines for which training facilities do not exist in Malawi, and in occupational fields where Malawi is experiencing shortages of skilled manpower. The numbers of students receiving training outside Malawi are shown in Table 4.11.

As was commonplace with many of the newly established universities in Africa in the 1960s the University of Malawi adopted the British formal

TABLE 4.11 NUMBER OF MALAWIANS STUDYING ABROAD BY FIELD OF STUDY, 1968 - 1978

Field of Study	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Accountancy	3	1	3	1	13	23	32	34	40	35	37
Law	10	8	6	2	1	6	3	3	5	6	10
General Arts Degree	12	10	9	4	15	14	13	9	10	5	12
Anthropology and Social Studies	12	11	4	3	20	7	3	7	8	17	6
Economics	20	13	11	4	14	15	15	17	19	12	14
Statistics	10	8	3	1	7	4	6	11	15	10	6
Science Degrees (B Sc and Post Graduates)	11	8	9	2	9	11	10	14	16	14	15
Nursing and Allied Subjects	70	71	48	11	45	32	25	25	28	23	-
Medicine, including Premedicine	58	53	47	6	58	51	52	46	53	49	71
Other Medical Subjects	11	12	19	3	32	16	20	20	29	17	13
Agriculture	22	17	14	8	22	21	36	43	63	30	31
Forestry	11	8	15	5	16	4	7	7	16	18	2
Fisheries	2	1	1	1	2	3	5	5	9	2	4
Geological Studies	8	7	12	1	12	5	4	2	8	3	3
Veterinary Studies	12	14	14	8	29	17	27	16	29	11	14
Civil Engineering	18	22	23	8	20	11	11	21	26	30	26
Electrical Engineering	17	20	18	2	19	19	26	28	33	37	25
Mechanical Engineering	4	4	5	-	12	15	21	28	31	39	28
Radio Engineering	2	1	1	-	1	1	1	1	1	-	-
Telecommunication Engineering	15	28	30	16	20	13	15	6	28	14	12
Civil Aviation	3	4	-	4	8	6	8	9	23	9	9
Broadcasting	12	6	-	6	3	3	1	1	6	2	-
Education	49	41	43	44	37	36	29	30	60	4	34
Public Administration	13	8	7	14	13	3	2	6	26	7	15
General Certificate of Education(1)	15	15	15	-	25	38	39	41	43	42	39
Architecture	3	6	8	1	10	5	8	8	8	7	7
Navigation	-	-	-	-	-	-	-	-	3	3	3
Librarianship	-	-	-	-	-	-	-	-	5	4	7
Printing	-	-	-	-	-	-	-	-	6	5	4
Police	-	-	-	-	-	-	-	-	6	9	-
Post Office	-	-	-	-	-	-	-	-	12	9	12
Land and Quantity Surveying	-	-	-	-	-	-	-	-	13	1	7
Town and Physical Planning	-	-	-	-	-	-	-	-	6	8	-
Marine Engineering	-	-	-	-	-	-	-	-	6	4	8
Motor Mechanics	-	-	-	-	-	-	-	-	4	5	4
Chemical Engineering	-	-	-	-	-	-	-	-	5	5	4
Meteorology	-	-	-	-	-	-	-	-	10	5	4
Business Administration	-	-	-	-	-	-	-	-	11	9	14
Theological and Leadership Studies	-	-	-	-	-	-	-	-	25	15	18
Other	83	74	65	64	143	89	81	98	95	52	70
TOTAL	506	471	430	219	606	468	500	536	840	577	587

(1) Including Advanced and "O" Levels

SOURCE: Personnel Division (Training Office), Office of the President and Cabinet

educational structure with little if any adaptation to its own requirements. The result initially was an undue emphasis on the Arts and the eventual graduation of students ill-equipped to assist in the implementation of the developmental objectives of the country, a situation which gave rise to a number of workshops and conferences in Africa on this subject, one of the most notable being at the University of Accra, Ghana, by the Association of African Universities. This Association in 1972 expressed the desire to

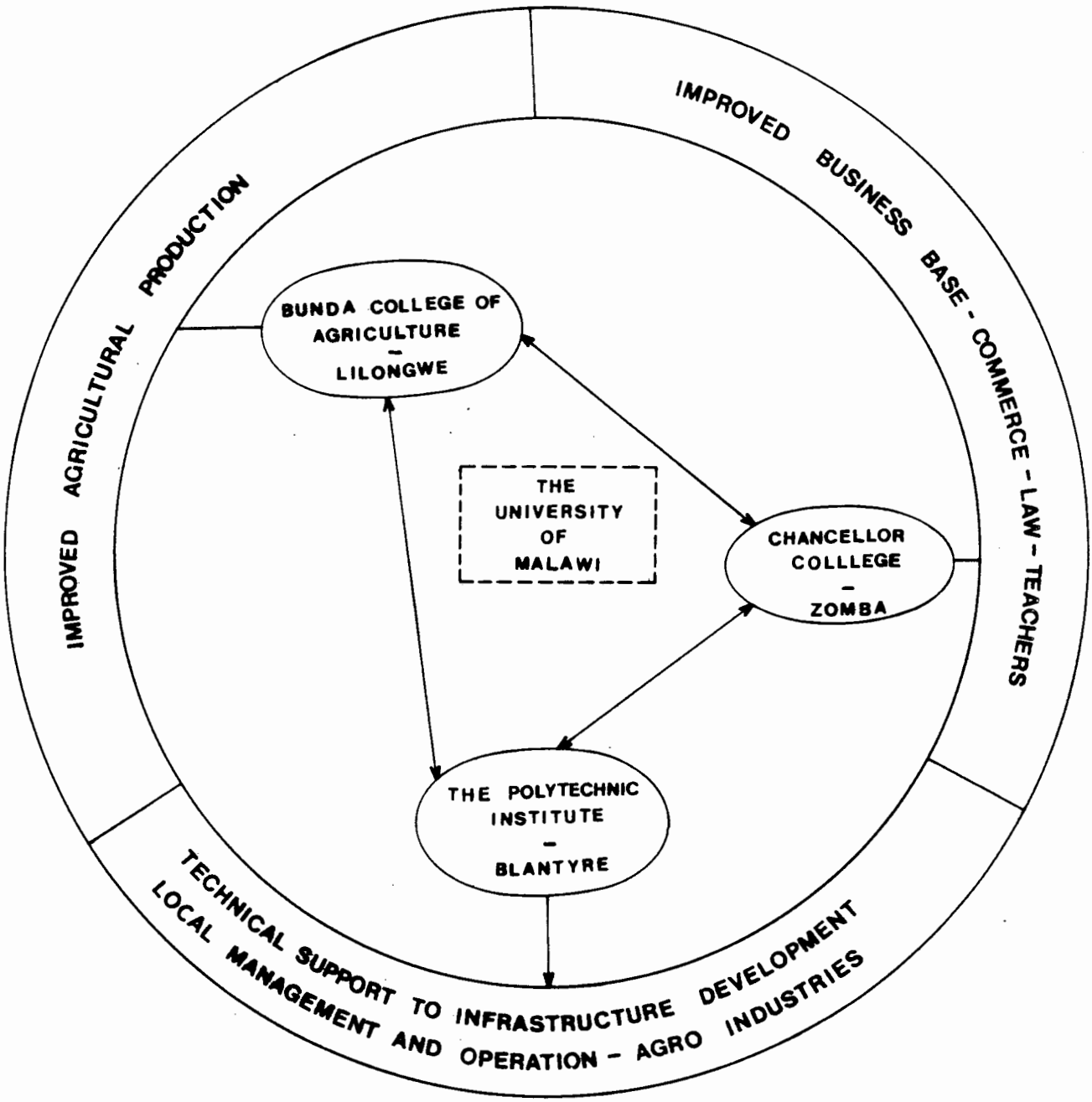
> formulate a new philosophy of higher, particularly university education for Africa, in the hope of evolving institutions that are not only built, owned and sited in Africa, but are of Africa, drawing from Africa inspiration, and intelligently dedicated to her ideals and aspirations. (Yesufu 5;1973)

Acknowledgement of such issues led to a restructuring of the University system in Malawi beginning in 1968, with the formal organisation of all the institutions of higher education into three distinct, but interrelated colleges, as shown in Figure 4.2. The University of Malawi is thus subdivided into the following three colleges, each with a distinct function.

4.5.5.1 Chancellor College: located at Zomba near the central area of population distribution, which provides for teacher training and education in the arts, and in Public Administration and the Legal spheres. Great emphasis is placed on the role of Chancellor College in the training of secondary school teachers, particularly in those fields in which Malawi experiences the greatest manpower shortages, the sciences and mathematical fields. To this end, aid has been obtained from the International Development Association, and expansion of the teacher training facilities is being carried out to help meet the requirement of the public and private sectors for increased numbers of better qualified school leavers.

The extent of such attempts at increasing enrolments are reflected in the Economic Report of 1980 (52;1980) which records an increase of 20% from 1153 students in 1977/78, to 1386 in 1978/79, although this was in large part due to the introduction of special accelerated courses for secondary school teachers. The 1980 plans however, reveal a

FIG. 4.2 : MALAWI'S INTEGRATED HIGHER EDUCATION SYSTEM AS IT IS GEARED TO MALAWI'S LONG RANGE DEVELOPMENT POLICY



SOURCE: (U.S. AID Report (AAA/AFR/DR; Appendix ; 1980)

continuing move towards rapid expansion of facilities at Chancellor College, and the possible introduction of new courses.

4.5.5.2 Bunda Agricultural College: located in the north of the country near the richest agricultural areas and the agricultural development schemes. This college offers a three-year Diploma in Agriculture and a four-year Degree to a very limited number of students. Emphasis is placed on the introduction of new agricultural techniques while ensuring that these are in line with the existing technological expertise in the country.

4.5.5.3 The Polytechnic Institute: located in Blantyre in the industrial centre of the country and which offers Diploma courses of three-year duration and shorter Certificate courses in Business Studies, Engineering, Laboratory Technology, Commercial courses, Public Health Inspection, Electronics and Technical Teaching.

Established in the early 1960s, the Polytechnic was the first higher level institution to be structured so as to meet the developmental requirements of Malawi. Emphasis was laid on the provision of courses in practical, vocational, and technical skills as well as adult education in day and evening classes. While graduates from the Polytechnic generally work in specialised jobs and in modern urban areas, it is felt that their training contributes to the development and improvement of conditions in the rural areas in a number of ways - mainly by means of their contributions to increasing and diversifying agricultural production projects. (Action Memorandum;17;1980).

Although it provides important apprenticeship courses, the Polytechnic Institute has however, to date, been a weak link in this tripartite university structure, particularly in view of the fact that it does not provide for Degree courses in areas which are clearly of vital importance if continued expansion is to be undertaken in the industrial sector. The expansion of secondary industries is a vital part of the country's developmental objectives which stress the utilization and processing of increased agricultural output by this sector.

The importance of the Polytechnic as the main centre for technical education is further stressed by the declining standards experienced in

the few existing technical schools. These technical schools, receiving very limited financial assistance from the government have furthermore been forced to cut back on their student intake, with enrolment declining by 13% from 913 students in 1977/78 to 791 in 1978/79. (Economic Report;51;1980).

Recognition of this factor led to a move in 1973 to establish the National Advisory Council for Technical Education and Training, a body composed of members from Government Ministries, training institutions and private industry and commerce. Its main function is to provide the Ministry of Education with continuing information of manpower needs, particularly in the building and engineering sectors, in order that adjustments may be undertaken in the training programmes to suit the development requirements. The establishment of this body led to significant conclusions regarding the need for increased training opportunities in the engineering and scientific fields if manpower requirements are to be met in the future. Manpower shortages are particularly acute at the high and intermediate skill level, and this is precisely where the Polytechnic has a role in fulfilling the requirements of the nation. Hence, attempts have been made to expand facilities at the Polytechnic while improving the quality of the standard of education provided to degree level. Assistance to this end has been obtained from the U.S. AID organisation.

The structuring of the University into the three colleges thus provides for vital inputs into each of the major developmental sectors of the country, with a continuing emphasis on the importance of agricultural development in the growth of the country. The important links between the education provided at the University level, and the developmental priorities of the nation, are reflected in the assessment of the role of the university by the U.S. AID Survey (H1-H2;1979) -

> The education and careers of the graduates - by design - will fit into the country's development philosophy. These students will choose to continue their education in one of the three colleges of the University. Regardless of their choice, these students will end up as future leaders that tie the outputs of the small landholder into an integrated national economy. They will become the future business managers, the accountants and lawyers and the engineers who plan and implement future water and irrigation schemes; manage new secondary industries built to capitalize on the country's rapidly developing [illegible]

infrastructure, and provide further outlets and new uses for Malawi's agricultural produce.

Hence the importance of the university is seen to lie ultimately in achieving an upgrading in the levels of the rural poor by means of improved agricultural production and productivity of supporting sectors of the population.

4.5.6 The Development of the Teacher Training Colleges

Naturally, the improvement and expansion of educational facilities at all levels will be very largely dependent on the availability of suitably qualified teaching staff; a requirement that cannot possibly be met by expansion of facilities at Chancellor College alone. Consequently, the Ministry of Education has looked to the establishment of new Teacher Training Colleges and the expansion of existing facilities, particularly as a means to increasing the numbers of primary school teachers.

In 1975/76 eight training colleges were in existence to train teachers for the lower educational levels, although only two were solely reliant on government funds, the remaining six relying on mission and charity funds in addition to government aid. The level of training provided by the various training colleges differs considerably, with the two government colleges at Blantyre and Lilongwe being the only ones to offer courses at what is known as the T_2 level - i.e. these courses are available only to holders of the Malawi Certificate of Education. The remaining colleges cater for T_3 courses which have a lower entrance requirement - the Junior Certificate which is awarded after two years of senior school.

Although entrance requirements to these training colleges would thus appear low by most western standards, it appears that training at the T_2 level is quite adequate to bring about significant improvements in the level of primary education, while remaining within the cost margins required by a restricted budget. Indeed, the decade from 1966 has been marked by a substantial increase in the quality of training received for the primary school teachers at large. In 1966 the majority of primary school teachers fell into the T_4 and T_3 brackets, the T_4 category having received only primary school education and no formal teaching

training. By 1970 however, the T_4 bracket had been discontinued, while a move was also being made to increase the training at T_2 level. The Ministry of Education reports (10 Years of Development and Progress; 5;1976) that in 1965/66 there were only approximately 60 T_2 students out of a total enrolment of 1340, but in 1975/76 almost one-half of the 1050 students in training colleges were T_2 students. While these figures represent an increase in the standard of teacher training they do not however, reveal a substantial decrease in the number of students enrolled at training colleges, a factor which was not in line with developmental requirements that the provision of primary school education be expanded as rapidly as possible. Steps taken to remedy this situation included maximum utilization of places at existing colleges, and the opening of a ninth college funded by an IDA grant at Mzuzu in the northern area of the country, with the result that an increased enrolment of 9.2% was recorded in 1979 with 1565 students. Such expansion is reflected in Table 4.12 below:

Table 4.12 Primary School Teachers' Training College Enrolment 1973/74 - 1978/79

Type of Course	Year of Study	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79
T3	1	416	397	268	438	561	655
	2	376	387	368	452	429	485
	Total	792	779	636	890	990	1,140
T2	1	258	261	150	214	238	227
	2	256	243	264	214	205	196
Grand Total		1,306	1,283	1,050	1,350	1,433	1,563

(Source: Economic Report;52;1980)

Further attempts to improve the quality of teaching have focused on the provision of upgrading courses for existing teachers, provided by means of the Malawi Correspondence College and Broadcasting Unit in conjunction with attendance at formal lectures. These upgrading schemes, lasting 10 months, are thus important in that they permit improvements in

qualifications from T_3 to T_2 and T_4 to T_3 grades, while not removing teachers from their teaching positions or placing undue financial strain on the individual or government.

In addition to improvements in the quality of primary school teachers, the Ministry of Education aimed also at achieving, by 1980, a more realistic pupil to teacher ratio of 45:1. Such a goal, however, in view of the rapid increase in population and the decline in economic growth, proved unobtainable in that period. However, recent reports by the World Bank reveal evidence supporting the notion that class size need not necessarily be strongly correlated with poor educational standards. (World Development Report; 1980). The studies conducted evaluated student achievement in countries with classes of over 60 pupils (Chad, Malawi, Zaire and Central African Republic) with achievement in smaller classes of below 25 (Iran, Bolivia, Uruguay, Mauritius). The results of the study revealed that in classes of between 15 and 40 pupils, students learn more, but the benefits are slight. Reducing an elementary school class from 40 to 15 can be expected to improve average achievement by only approximately 5 percentage points.

Improvements in the quality of teaching are however vital and are goals that should be rigorously pursued if there is to be an increase in the number of Primary School leavers eligible for secondary school admission. Moreover, improved standards of education at the primary level will have results even among those pupils who receive only one or two years of education, as they return to their rural areas with an improved knowledge of basic agricultural techniques and a foundation in literacy, numeracy and economic management.

4.6 CONCLUDING REMARKS ON THE MALAWI EDUCATIONAL SYSTEM

Having examined the structure of the educational system in Malawi and the moves which have been made to improve the quality and quantity of education at all levels, it could be concluded that Malawi has made considerable progress in the move towards the provision of a more equitable system of education, while having also established close links between manpower requirements and educational planning. Nevertheless, despite some positive moves in this direction, educational planning on the whole has evidenced a considerable degree of fragmentation and a lack of continuity and co-ordination.

One striking example of the deviation from educational policy and planning programmes has been the establishment of the elitist Kamuzu Academy, opened in November 1981 at a cost of U.S. $20 million, a large proportion of which was reportedly paid by the Life President as a 'gift to the nation'. (Africa Now;80;1982). The Academy was established to provide an education for approximately 360 of Malawi's most talented children. Emphasis throughout has been placed on academic excellence, with a curriculum based closely on that of an English Public school and including Greek and Latin, reportedly at the President's insistence (op cit). Such a curriculum has of course required the employment of expatriate teachers, at considerable cost to the nation, since no Malawians are qualified to teach in such subjects. The project is made even more discordant with Malawi's development plans by the fact that the stated aim of the Academy is to enable the Academy graduates to continue their education abroad, at universities such as Harvard and Oxford, rather than at the University of Malawi. Clearly, the majority of Malawians will receive limited benefit from the privileges offered at the Academy and from the financial investment incurred by its existence. This situation is not atypical of the LDCs. "Inappropriate" education based on western models is exceedingly common (as discussed in Chapter 2) frequently giving rise to a growing category of 'educated unemployed', as is evidenced particularly in India. Riggs (153;1964) interprets the continued demand for such 'inappropriate' education in terms of his prismatic model -

> Eligibility (for acceptance into the bureaucracy or civil service) is measured by status and rank, by diploma or certificate, rather than by relevant learning skills... schooling becomes valued more as a means of social and political mobility than for any appeal of learning, professional competence and work.

Fragmented educational planning and an absence of co-ordination within the plans is also evident when the relative rates of expansion of facilities are compared. Expansion, particularly at secondary school level, has been undertaken without due regard being given to the requirement that there be sufficient teaching staff, which in turn has necessitated a hurried expansion of this sector.

The fluctuating numbers of teachers being trained to meet the expanding requirements is evidenced in Table 4.13, and it is clear that in view of

TABLE 4.13 NUMBER OF TEACHERS IN PRIMARY, SECONDARY AND OTHER[1] SCHOOLS BY REGION, 1974/75 - 1978/79

Year	Primary Schools			Secondary Schools			Other Schools[1]		
	Northern Region	Central Region	Southern Region	Northern Region	Central Region	Southern Region	Northern Region	Central Region	Southern Region
1974/75	2,410	3,695	4,419	142	230	325	151	215	553
1975/76	2,393	3,853	4,342	147	237	364	139	217	489
1976/77	2,713	3,790	4,232	146	230	329	198	270	511
1977/78	2,751	3,974	4,390	143	224	370	25[2]	71[2]	79[2]
1978/79	2,558	3,988	4,879	147	221	371	38[2]	80[2]	46[2]

(1) Technical Schools, Teacher Training Colleges and Malawi Young Pioneers.

(2) Excluding Malawi Young Pioneers.

SOURCE: Ministry of Education and Ministry of Youth and Culture.

the required expansion of secondary school facilities, there has not been a sufficient increase in the numbers of teachers trained at secondary level.

The Polytechnic Institute has similarly experienced years of fluctuating student enrolments, due largely to periods when teaching staff were unavailable, or to periods when the labour market was saturated in specific occupations. These factors are evident in the examination records evidenced in Table 4.14.

Table 4.14 Examination Results - The Polytechnic

Name of Award	1973	1974	1975	1976	1977	1978	1979
Dip.Bus.Stud	29	36	40	39	42	49	32
Dip.Eng.	29	35	42	29	36	37	42
Dip.T.T.	-	-	-	-	-	11	19
Dip.Lab.Tech	-	12	18	-	22	-	-
Dip.P.H.I.	10	-	-	12	-	15	-
Pitman	868	1,132	1,194	1,289	1,190	1,773	388 (Mar.)
R.S.A.	169	134	263	139	218	233	
C & G (Full-time	154	156	173	192	139	66	
C & G (Part-time)	-	72	17	2	12	14	

(Source: The Polytechnic 1979-80 Pamphlet)

It is important that such significant fluctuations be brought more under control through plans more closely co-ordinated with industry and other educational institutions. Indeed, where financial resources are so severely limited it is essential that while student enrolment is increased sufficiently to ensure a continuing supply of skilled manpower, maximum use should also be made of all capital infrastructure established for this purpose.

Nevertheless, it would appear that Malawi has considerably improved the quality of education provided to its population at all levels. For instance, in Table 4.15 the figures reveal that the number of students in the 20 to 24-year age group who have attended at least some levels of secondary school total 28,043 as opposed to 961 persons in the 50 to 54-year age group. Similar ratios are available for those members of the population who have attended some levels of university education: 1,371 students had enrolled in the 28 to 29-year category as opposed to 334 university attendants in the 45 to 49-year bracket and 263 in the 50 to 54-year category. From such statistics, it can be surmised that there has been a significant increase in the number of students achieving these levels of education over a period of time.

Despite such improvements in the educational system, the literacy level has remained low in Malawi, in 1980, being at an estimated 25% (Africa Now; Apr. 1982 and World Dev. Report 1980). Moreover, as has been pointed out (Section 2.4), government funded investment in education as with all the social services, has essentially been rather limited, with a heavy reliance being placed on the availability of grants-in-aid, for the expansion of any educational facilities. The proportion of Government expenditure on educational facilities has moreover declined since 1978 with the decrease in economic growth and the slowing of the rate of increase in the GNP. While it can well be appreciated that such factors have necessitated even more stringent financial controls, cutbacks on investment in the human capital formation process clearly have profound long-term consequences for the country, and will severely affect the attainment of future developmental objectives. Although emphasis has been placed in Malawi's developmental plans on small-holder agricultural developments, the advancement of industrial development has been seen to be of increasing importance if balanced growth is to be attained. Undue and continuing emphasis on small-scale agricultural development, somewhat to the neglect of urban and industrial development, could well give rise to a situation similar to that in Ghana where continuing expenditure on rural development and agricultural education failed to stem the flow of migrants to the urban areas, or to encourage higher attendance levels at schools. It was only after considerable social upheaval within the nation that analysis of the

Table 4.15

MALAWI POPULATION AGED 5 YEARS AND OVER BY 5-YEAR AGE GROUP, SEX AND HIGHEST LEVEL OF EDUCATION ATTENDED AT NATIONAL LEVEL

SEX AND EDUCATION	TOTAL	5-9 YEARS	10-14 YEARS	15-19 YEARS	20-24 YEARS	25-29 YEARS	30-34 YEARS	35-39 YEARS	40-44 YEARS	45-49 YEARS	50-54 YEARS	55+ YEARS	NOT STATED
Both Sexes	4,467,344	825,313	570,648	540,834	448,952	437,063	306,167	276,570	203,683	218,663	146,844	483,492	9,115
Never Attended	2,412,788	657,768	230,426	188,614	188,775	193,018	142,960	144,533	114,092	130,967	92,095	325,750	3,790
Total Attended	2,015,664	143,544	338,053	350,925	238,824	242,630	162,056	130,950	88,751	86,861	54,198	136,103	2,768
Primary	1,917,393	143,544	337,294	338,102	229,731	217,081	147,474	123,863	85,368	84,913	52,974	156,340	2,511
Std 1	352,175	84,627	67,898	26,008	21,483	24,767	20,474	21,042	16,421	17,655	11,695	39,740	365
Std 2	370,484	40,731	87,059	42,138	29,935	32,253	24,930	25,040	15,673	19,513	12,037	37,743	420
Std 3	304,748	13,263	75,911	51,310	31,886	29,656	19,887	18,785	14,016	14,343	8,897	26,412	382
Std 4	246,572	3,247	51,126	50,150	27,716	26,364	17,255	15,456	11,845	12,272	7,957	21,761	313
Std 5	208,283	1,001	31,658	50,552	28,650	27,795	17,755	14,128	9,202	8,731	5,117	13,397	263
Std 6	132,813	100	12,195	35,452	21,570	19,889	11,997	8,627	5,653	5,535	3,524	8,080	198
Std 7	106,980	75	7,541	33,955	21,608	17,952	10,806	5,603	2,838	2,298	1,233	2,934	137
Std 8	195,335	-	3,908	47,965	46,853	38,405	24,346	15,152	6,720	4,566	2,514	4,473	433
Secondary	92,324	-	759	12,644	28,043	24,178	13,361	6,387	2,942	1,615	961	1,196	238
Form 1	13,337	-	319	3,703	3,370	2,667	1,753	767	292	172	104	154	36
Form 2	43,377	-	256	5,473	12,812	11,677	6,159	3,521	1,621	848	447	457	96
Form 3	7,615	-	112	1,599	2,384	1,653	1,158	351	137	81	48	66	16
Form 4	26,286	-	66	1,795	9,313	7,804	3,902	1,564	755	409	250	354	88
Form 6	1,699	-	6	78	154	377	389	184	137	105	112	155	2
University	5,945	-	-	179	1,050	1,371	1,221	700	441	334	263	367	19
Year 1	483	-	-	69	157	69	60	32	26	21	15	34	-
Year 2	378	-	-	75	191	45	34	11	7	8	3	7	1
Year 3	358	-	-	26	187	69	28	23	7	8	4	6	-
Year 4+	303	-	-	5	99	79	35	29	19	11	12	14	-
Diploma	2,109	-	-	7	262	594	523	256	167	107	79	126	8
Degree	2,314	-	-	1	154	515	541	349	233	179	150	180	10
Not stated	35,892	24,001	2,169	1,295	1,353	1,415	1,151	1,087	840	834	551	1,639	2,557

(Source: Malawi Population Census 1977;137;1980)

situation revealed that inadequate investment had been undertaken in the urban sector.

The situation takes on even more import when the exceedingly rapid rate of population growth is taken into consideration. Even if educational expansions were occurring at twice the current pace, the literacy rate could not be substantially improved at the current rate of population expansion. This alarming situation is reflected in the statistical information given in Table 4.15. Assuming that adults entering primary school 18 years ago , at the time of Independence in 1964, have now attained an age of around 20 to 24 years, examination of the statistical information reveals that approximately 229,731 persons in this age category have attended at least one level of primary school. However, taking the statistics available for the 10 to 14-year age group into consideration, although they reveal an increase in enrolment in the region of 107,563 students, such an increase is hardly adequate to cope with the population increase of approximately 2.9%. Assertions have thus been made stating that the number of children entering the educational system has actually declined since the colonial era, (Africa Now; Apr. 1982 & Williams;1978) while in contrast, other nations in Africa, notably Tanzania, have achieved considerably higher literacy rates while also operating within a severely restricted financial budget. In fact, it is reported that Tanzania with a population three times that of Malawi's, has achieved a literacy rate of almost 70%. Moreover, in China, although statistical information is generally difficult to obtain, it would appear that even with the huge population to be supported, a literacy rate of 66% has been obtained with a net primary school enrolment of 93%. (World Development Report;101;1981).

Achievements in increased literacy levels by nations such as China and Tanzania have in large part been a consequence of concerted efforts in the related and interdependent areas of health and nutrition, population control, the provision of basic education, in addition to well formulated and co-ordinated long-term plans. It would appear then, that if Malawi is to continue to pursue the goals of balanced development and economic growth, a more positive step must be taken to ensure that well formulated plans are established for all sectors with particular attention being given to a careful evaluation of future human capital requirements within

the nation and the requirements for expanded education and training facilities. Indeed, the situation clearly requires a careful analysis of the full costs to the nation of investment and expenditures on education in relation to the future benefits which could be derived from the availability of a pool of suitably qualified and trained personnel.

CHAPTER 5

THE ASSESSMENT OF EDUCATIONAL PLANNING MODELS AND THEIR CONTRIBUTION TO "ACCELERATED DEVELOPMENT"

5.0 THE ROLE OF SOCIAL EXPENDITURE IN THE "ACCELERATED DEVELOPMENT" PROCESS

While the important part played by national planning in the development process was fully appreciated in the early 1960s, the role of educational planning and its links with the process of 'accelerated development' had yet to be fully realised. Indeed, as was evidenced in the United Nations First Development Decade Plans, little attention had been given to the importance of investment in the social facets of the economy at all. While a number of reasons have been put forward as to why this situation arose, it appears that the most likely factor was that expenditure on physical capital and resources yielded 'concrete' and visible returns which could be accounted for in terms of precise quantitative monetary measures. Where financial resources were strained and subject to great demands from all sectors, in political terms it appeared at the time that imposing physical structures would provide positive evidence of 'progress' and 'modernization'.

Within a decade or so it became increasingly clear that expansion of physical capital alone would not give rise to balanced growth at the rapid rate desired. Attention turned more to the role played by factors other than physical capital and labour in the development process. It was recognised in the United Nations Second Development Decade (1970-80), that carefully directed social expenditure, in areas such as health, education, improved nutrition and the creation of a skilled labour force, could yield greater returns to investment than expenditure on physical capital which seldom gave rise to substantial or positive outputs.

As Balogh (353;1968) points out, moves to undertake investigation and measurement of the precise benefits of social expenditure were impeded for a number of reasons, among them the following:

- Their direct output is often not easily measurable or quantifiable.
- Their effects are widely diffused.
- Their effects are spread over a long time.

- There exists no determinate functional relationship between inputs and outputs, partly because success is contingent on complementary measures.
- Such investments cut across the traditional distinction between investment and consumption (on which many growth theories are built), according to which a sacrifice in current consumption can make future consumption greater than it would otherwise have been.
- Moreover, such investments are frequently correlated with other causes of higher productivity from which they are not easily separated.

While such factors as the above posed problems in the formulation of planning models which included these social aspects, it was realised that the concept of 'capital formation', which had traditionally been identified with increases in physical structures, expansion of land utilization, the use of durable equipment and such like, should be wider in concept, including the training level and knowledge capacity of the population at large. Indeed, considerable practical and theoretical advancements were made with the realisation that expenditures on health, education facilities, etc. raised the productivity of the populace of the nation, thus yielding positive returns to investments made in such spheres.

5.1 THE SIGNIFICANCE OF HUMAN CAPITAL INVESTMENT FOR THE DEVELOPMENT PROCESS

Hence, it was asserted that expenditures directed at improving the well-being and skills of the population should be viewed as a type of capital investment. For as Blaug (19;1976) pointed out,

> ...a good cause (can) ...be made for the view that educational expenditure does partake, to a surprising degree of the nature of investment in future output. To that extent, the consequences of education in the sense of skills embodied in people may be viewed as human capital, which is not to say that people themselves are being treated as capital - i.e. the maintenance and improvement of skills may be seen as investment in human beings, ...human capital is the present value of past investment in the skills of people, not the value of people themselves.

Further analysis of this proposition yielded interesting information regarding the levels of investment in these areas in the more advanced western societies. These nations have in fact concentrated considerably higher proportions of their investment in the social spheres rather than in non-human capital. Schultz (1968) thus proposes that this might be

the most distinctive feature of the economic systems of these countries, and indeed be accountable for their rapid economic growth.

Typically, in the advanced nations, the outcomes of investments in human resources are not fully indicated in the conventional national accounting system, which has tended to treat expenditures in those areas as consumption items, rather than as investments in capital formation. Interest in the LDCs tended to focus on increased expenditure and investment in physical capital formation, with a likewise tendency not to view investments in the formation of human capital as expenditure on capital. However, such strategies failed to take account of the fact that under-investment in human capital necessarily limits the productivity of physical capital investment, since a vital input to such productivity will be the knowledge and skills of administrative and technically trained personnel.

Possibly due to such vagaries of interpretation regarding investments in human resource expenditures, the LDCs in their early moves towards development objectives failed to recognise the importance of human investment. The failure to invest in the social spheres has thus hindered the capacity of the people to participate in the move towards 'accelerated development' as reflected in Meier's (519:1976) analysis of the situation:

> The characteristic of 'economic backwardness' is still manifest in several particular forms: low labour efficiency, factor immobility, limited specialisation in occupations and in trade, a deficient supply of entrepreneurship, and customary values and traditional social institutions that minimize the incentives for economic change. The slow growth of knowledge is an especially severe restraint to progress. The economic quality of the population remains low when there is little knowledge of what natural resources are available, the alternative production techniques that are possible, the necessary skills, the existing market conditions and the opportunities, and the institutions that might be created to favour economising effort and economic rationality. An improvement in the quality of the 'human factor' is then as essential as investment in physical capital.

5.1.1 Early Approaches to Human Investment - The Cobb-Douglas Production Function

In line with the recognition of the importance of human investment, models were constructed in an attempt to isolate the contribution to economic growth and development of expenditure in the areas of education, health, research, etc. One of the earliest influential approaches was the

Cobb-Douglas production function, taking the format:

$$Y = ak^{\alpha}L^{\beta}H^{\gamma}$$

where:

- Y is national income
- K is capital
- L is labour
- H is a catch-all for 'human factors' such as education, health, etc.
- $a\alpha\beta\gamma$ are constraints and $\alpha+\beta = 1$

(Schultz;384;1968)

The assumption then is that anything not caught in the factors K and L will be attributable to H.

While such attempts as the above model were important in that they marked a move away from the preoccupation with physical investment, it tended to be a somewhat naive approach to a complex situation where many of the benefits derived from H were in fact secondary effects. Thus, while such models had some application to the advanced countries, they had little application to the LDCs.

Hence, despite the recognition of the importance of a trained and motivated work force, and the instigation of investigations in this area, the educational deficiencies of the LDCs continued to pose severe restrictions on economic growth and advancement. Indeed, it was clear that, operating within the restrictive financial frameworks, and faced with an absence of vital structural facilities and the necessary skilled personnel to introduce rapid educational expansion, any revolutionary change within the existing educational frameworks would of necessity take several decades.

5.2 SHORTFALLS OF SKILLED MANPOWER IN THE LDCs - EARLY "REMEDIES"

5.2.1 Reliance on Expatriate Personnel

Attempts were made on several fronts to counteract the shortage of skilled manpower in the LDCs so as to overcome some of the constraints posed to development by the shortages of personnel. Early "remedies" in this direction focused on the employment of foreign experts and technicians which represented a somewhat costly and short-term solution

to the problem. Schumacher (146;1973) moreover, cites instances where the reliance on expatriate personnel has resulted in the utilization of inappropriate technology and indeed, the establishment of projects quite unsuited to the country's needs and stage of development. As Schumacher (op cit) points out,

> The task is to bring into existence millions of new work places in the rural areas and small towns...Puerto Rico furnishes a good illustration of the point - Development of modern factory-style manufacturing makes only a limited contribution to employment. The Puerto Rican development program has been unusually vigorous and successful, but from 1952-62 the average increase of employment in EDA-sponsored plants was about 5000 per annum. With present labour force participation rates, and in the absence of net emigration to the mainland, annual additions to the Puerto Rican labour forces would be in the order of 40 000. Within manufacturing there should be imaginative exploration of small-scale, more decentralized, more labour-using forms of organization such as have persisted in the Japanese economy to the present day and have contributed materially to its vigorous growth.

It is similarly reported (Todaro;1981) that in India and Turkey the implementation of highly ambitious five-year plans has actually yielded increased rates of unemployment at the end of the five-year period.

5.2.2 The Introduction of Mechanization

More attention was given to the possibilities of increasing mechanization in fields which experienced a shortage of skilled manpower, thereby supposedly doing away with the need to train personnel in those areas. The shortsightedness of such an approach soon became apparent. Technologies were being introduced which were largely inappropriate to the circumstances of the LDCs and which thus failed to stimulate any development of production techniques appropriate to each nation. Investment in mechanization was costly and moreover diverted limited resources away from expenditure in other sectors, more particularly in areas involving social investment. The result was frequently growing discontent among the rising levels of unemployed along with many associated social problems.

5.2.3 The Transfer of Advanced Technology

In another attempt to circumvent the limitations to development posed by shortages of skilled manpower, attempts were made to transfer existing

technologies directly from the industrialized nations to the LDCs. However, as with attempts at the introduction of advanced mechanisation, it was found that transferred technology was frequently inappropriate to the resource needs and endowments of the nation to which they were introduced. As Schumacher (1973) points out, these implanted technologies frequently relied upon capital intensive techniques and were appropriate to a highly sophisticated population. What was needed in the LDCs on the other hand, were technologies which would enable the population to participate in such schemes and to assimilate knowledge appropriate to the environment in which they operated, a practice which has been adopted in China and Tanzania.

5.2.4 Investment in Human Resources - the "Appropriate Remedy"

The overriding conclusion reached as a result of the remedies taken to accelerate development was that such actions were of little import unless the populations of the nations were actively involved in projects which were suited to the country's resource needs and stage of development. The role of the population in accelerating development was thus seen to be fundamental at all levels. As Singer (72;1964) pointed out, "Progress, based as it is on human investment, must always be a domestic product".

This growing emphasis on investment in the production of human capital was given further impetus as it became evident that any additional investment in physical capital could not be productively utilised without adequately trained technical and administrative personnel to make effective use of it. According to Meier (520;1976) findings in many of the LDCs point to the fact that "...the absorptive capacity for physical capital has proved to be low because the extension of human capabilities has failed to keep pace with the accumulation of physical capital."

However, despite acceptance of the important role of social expenditure in the development process, it is still undetermined as to which aspects, education, health, nutrition, research, etc., warrant greater or lesser levels of expenditure, and indeed, the difficulties of determining the relative merits of various areas poses considerable methodological problems. Schultz (2;1962) lists a number of areas which are likely to positively affect development if investments are made in them:

a) Health facilities and services, broadly conceived to include all expenditures that affect the life expectancy, strength and stamina and nutrition of the population.

b) On-the-job training, and apprenticeship schemes.

c) Formally organised education at the elementary, secondary and higher levels.

d) Study programmes for adults, notably in agriculture.

5.3 THE IMPORTANCE OF EDUCATION IN "ACCELERATED DEVELOPMENT"

Much of the attention regarding the importance of social investment has been concentrated on the provision of formal education. This was possible largely due to the recognition that education permeated all aspects of social, cultural and industrial advancement, while also taking account of the role it clearly had played in economic advancement in the industrialised nations. In view of the fact that the results of educational investment had such a long gestation period, frequently twenty years or so, the role of rational planning in the process drew increasing attention.

Early enthusiasms on this score are reflected in the proceedings of the Addis Ababa Conference on Education in 1961 (Section 3.1) and in statements regarding the role of educational planning by the United Nations Santiago Conference on Education in 1962:

> The overall planning of education is a continuous, systematic process, involving the application and co-ordination of social research methods, and the principles and techniques of education, administration, economy and finance, with the participation and support of the general public in education for the people, with definite aims, and in well-defined stages, and to providing everyone with an opportunity of developing his potentials and making the most effective contribution to the social, cultural and economic development of the country. (Cited in Anderson;357;1968)

Clearly, such all-encompassing and far-reaching definitions, while taking cognizance of the need for some positive form of educational planning, failed to provide any directives as to how this was to be achieved. On the one hand, these definitions included the total operations of the educational system at all levels, while on the other hand the definitions failed to analyze the functions of the educational

system on a wider basis or to consider anything other than formal educational systems. Indeed, little attention was given even to the greater systemic framework within which education operated and its obvious relationship to manpower production and development.

5.4 THE INTEGRATION OF EDUCATIONAL PLANNING AND NATIONAL DEVELOPMENT OBJECTIVES

Educational planning frameworks thus began to take on two differing aspects; either planning was treated as an adjunct of general economic planning or it was treated as an aspect of planning in its own right, with economic elements playing only a small part in its overall formulation. The latter approach was the more commonly accepted in the 1960s, with the emphasis being on the provision of freely available education to all the population as far as resources would permit, the attention being focused on the human rights aspects of the provision of education as was evidenced in the outcomes of the Addis Ababa Conference (1961), the Santiago de Chile Conference and the Ashby Report in Nigeria. (Section 3.1 and 3.2).

This initial flush of enthusiasm regarding the unqualified expansion of educational facilities, was soon counteracted by the growing proportion of the national budget that was evidently going to have to be set aside to meet the rapidly increasing demands made on the educational system. It was also becoming clear that the educational facilities provided needed to be more closely aligned to the country's development plans and priorities if the expenditure on education was to contribute in any significant way to the economic advancement of the nation.

Indeed, the issue gaining considerable import at this time was why formal education planning was actually necessary at all. Proponents of the free market system questioned the rationale of planning at all, positing that the provision of education and the expansion of the system should be determined as far as possible by the fluctuations of the market system, and the demands made on the system by the students.

The propositions that educational provision be left to the free play of the market forces lost their appeal however, when closer examination of the inherent characteristics of the educational system revealed that

education appeared to have the characteristics of a 'public good'. Thus, to leave its provision to the free play of market forces would in effect result in a case of market failure. The education "industry" as such has as few of the typical features which signal changes in the supply and demand aspects or in tastes and preferences. The effects of price are not adequately reflected in changes in demand, while the same applies for factor costs and production possibilities on the supply side. As Cohn (315;1979) points out, so long as calculations regarding supply and demand cannot be made with any degree of certainty, or if dissemination of information on education is impossible or too expensive to be incurred, optimal allocation of resources cannot be guaranteed. Consequently, it is asserted that manpower requirements within the nation at large are likely to differ substantially from the available manpower being produced by a freely fluctuating system. This has clearly been the case in India where an absence of educational planning has in large part been the cause of a burgeoning population of "educated unemployed". Owing to a lack of knowledge regarding the profitability of certain kinds of educational investment, it is argued that any investment undertaken in education will not result in an optimal allocation of resources, either by the government of the nation concerned or by private individuals. A high degree of 'wastage' is therefore predicted if no planning is undertaken, particularly in view of the fact that education involves substantial investment over a considerable period of time.

Thus, in a poor nation where demands on financial resources are at a premium, it is essential that any expenditure incurred on education should be expected to maximize net returns. In order that this might be achieved it becomes necessary that some type of positive educational planning be undertaken at the national level.

5.4.1 Education as a Public Good

The move to implement formal educational planning gave rise to considerable debate regarding the infringement of individual freedoms. State intervention, in the form of educational planning was however justified on the grounds that education did in fact constitute a 'public good', for as Musgrave (803;1969) points out, "the peculiar nature of public goods is that their consumption is necessarily joint and equal: the more there is for one person, the more, not the less there is for

someone else". Moreover, the fact that education has the characteristics of a public good means that neither demand for education or the returns to education can really be adequately assessed.

Hence, educational planning was instigated on the grounds that it represented a public good, and as such not all its benefits could be confined to those who paid for its consumption. Investment in education was thus seen to yield benefits not only to the private individual, but also to society at large in terms of increased economic growth potential. Increased provision of educational facilities was thus aligned with desired future rates of economic growth, and thus educational planning became inseparable from the broader context of general economic planning. The overriding aim of educational planning became an increase in the productive manpower of the nation, and for the first time, the allocation of resources to education was equated with investment in capital formation. Such realisations led to the formulation and application of a number of formal planning techniques to the educational sector.

5.5 THE FORMULATION OF EDUCATIONAL PLANNING MODELS

In the formulation of such educational planning models, a number of difficulties were encountered which warrant attention if the adequacy of the various models is to be assessed:

a) The difficulties involved in the measurement of the consumption and investment aspects of education.

b) The difficulty of assessing the 'spillover' or public benefits of national expenditure on education.

c) The problem of assessing the value of investment in the differing levels of education.

d) The lengthy gestation period involved in human capital formation also presents particular problems in the formulation of an effective planning model.

5.5.1 The Difficulties Involved in the Measurement of the Consumption and Investment Aspects of Education

The most obvious difficulty facing model-builders concerned the problem of measurement of inputs and outputs of the educational system. Many of the difficulties associated with such measurement concern the

possibility of separating the consumption and investment aspects of any expenditures on education - i.e. can the resources expended on the educational system and the rates of return on such expenditure actually be identified and measured? It is important moreover, to be able to compare such investment and rates of return with expenditure in alternative growth areas.

The difficulties begin with the fact that expenditure on education combines features of both consumption and investment. It is not possible to categorise expenditure on education solely as an investment or consumption outlay, as Meier (523;1976) points out:

> The educational product, in the context of economic development... not only includes the components of education usually distinguished as consumption (i.e. enjoyment of the fuller life permitted by education) and as direct investment (with the gains accruing 'internally' in the forms of increased earnings to the educated persons) but also education as investment in the functioning of the economic and social system at large. These latter gains accrue 'externally' not only to those in whom the educational input is invested, but also to other members of the community."

The situation is further complicated by the fact that many of the benefits derived from education in terms of the consumption components have a considerable gestation period, and as such then, represent a form of investment for the future.

5.5.2 The Difficulty of Assessing the 'Spillover' or Public Benefits of National Expenditure on Education

Closely linked to the difficulties of measuring the consumption versus investment benefits of educational expenditure, is the problem of assessing the private and public benefits derived from such expenditure. Clearly, in the circumstances of a poor country, 'spillover' or 'neighbourhood effects' of expenditure on education can have important and positive implications for development potential within the nation. Not all the benefits or returns to education are confined to those receiving it and it is possible that the less educated could benefit from the various externalities generated by the educated.

Blaug (108;1976) however, argues quite conclusively against such assumptions, positing that the idea of the value of external benefits is grossly overrated, and indeed, constitutes something of a myth: "...there is virtually no evidence of any kind to support the idea... of external or indirect benefits to society... and indeed there is great confusion over what is meant by the spill-overs of education." Blaug thus postulates that any planning framework should not accord any significant attention to 'spillover' effects.

Blaug's analysis is though largely concerned with the issues of educational planning and investment in the developed industrialised nations, where the level of wealth is such that it permits education, to some extent, to be viewed as investment in a consumption item alone. It may be argued though, that in the poor Third World countries, the conditions imposed by severe financial restraints, the low level of provision of educational facilities, the high demand for education in addition to the requirements in the nation for increasing numbers of skilled personnel, prevent expenditure on education being viewed as a consumption item alone.

It is necessary that educational expenditure be viewed in terms of investment in development and economic growth, and as such, there can be little argument that in the Third World situation educational expenditure does appear to have important spillover effects to the rest of the economy, as is established by Meier (525;1976) -

> Perhaps the most important aspect of the external benefits of education lies in the change in the social and cultural climate, incident to the widening of horizons, which education entails... such a change is an essential condition of success for many LDCs. At the same time, this result is not an automatic consequence of education at large, but only of the proper type, quality and quantity of education. Supply of professional people who cannot be absorbed into appropriate positions may readily become an external diseconomy and source of instability.

The statistical and quantitative measurement of such spillover effects and their advantages to economic growth however, pose seemingly insurmountable difficulties.

5.5.3 The Problem of Assessing the Value of Investment in the Differing Levels of Education

Educational planning models are furthermore confronted with issues regarding what types of education should be provided, at what levels and in what quantities. In the early 1960s with the growing recognition of the importance of the role of human capital in the accelerated development process, there was a move to expand educational facilities to provide for mass education at the lower levels with fairly extensive provision at the higher levels, (Section 3.0). While such moves were admirable from the social and moral standpoint, the economic situation existing in the poor nations was such that there simply was not a demand for large numbers of educated workers, and expansion of the economic sector was unlikely to occur at a sufficiently rapid rate to accommodate such increases.

Furthermore, it became evident that the provision of subsidized mass education was extremely costly. Indeed, it required more funds than the poor countries were able to generate for such purposes. Since educational outlays compete for resources that have an alternative use in directly productive investment, it is essential to determine what proportion of national income should be devoted to education. And within the educational system itself, it is necessary to establish priorities for the various possible forms of education and training.

As has been discussed previously (Section 3.6), there is considerable controversy existing as to what levels of education warrant greater expenditures than others. Naturally, priority should be accorded to those areas training personnel in the various skills needed for projected future expansions. In the early stages of development, however, these areas are not always clearly defined or known. Planning frameworks in the past, particularly in Africa (Section 3.1), thus tended to emphasise the importance of primary school expansion above all others, although some have pointed to the extension of secondary education as being of great significance (Section 3.2). The importance of more accurate planning projections in the educational sphere is made clear in Professor Lewis' (87;1962) comments on the early education proposals in Africa in the 1960s:

> The limited absorptive capacity of most ... African economies .... especially owing to the backwardness of agriculture makes frustrations and dislocations inevitable if more than 50% of children enter school. This, coupled with the high costs due to the high ratio of teachers' salaries to average national income, and with the time it takes to train large numbers of teachers properly, has taught some African countries to proceed with caution: to set the goal of universal schooling twenty years ahead or more, rather than ten years ahead or less.

After the first few decades of independence, it became increasingly obvious in the LDCs, that the most viable and appropriate level of general education that could be obtained, was that provided at the secondary school level. Indeed, the most critical shortages of manpower tend to be experienced in the managerial, administrative and technical officer categories, as indeed is the case in Malawi, as evidenced in Table 5.1 overleaf. Lewis (1962) in fact posits that the vast majority of posts at middle and upper ranks can be filled by manpower trained to secondary school level. While this is not to propose the unqualified expansion of secondary level education, considerable extension of these facilities, along with vocational and adult education is definitely required if reliance on expatriate personnel is to be reduced.

The extent of increases at the various educational levels will be largely determined by the particular stage of development and level of manpower requirements existing within the particular country. Careful planning must however be the basis of any such expansions in the educational system if suitably qualified manpower is to be produced, and moreover, if the country is to avoid producing a population of educated unemployed as has occurred in India, Pakistan and Korea.

5.5.4 The Time Factor in Human Capital Formation

A further aspect which poses particular difficulties in the formulation of any effective planning model is the particularly long gestation period involved in human capital formation. Depending upon the particular educational process, ten or twenty years of training is not unusual, with even longer spans being allowed for teacher training to

TABLE 5·1 OCCUPATIONAL SUMMARY BY SECTOR AND CITIZENSHIP - MALAWI

MAJOR GROUP	PUBLIC SECTOR					PRIVATE SECTOR					GRAND TOTAL	VACANCIES
	TOTAL	MALAWIANS	NON-CITIZEN EUROPEANS	NON-CITIZEN AFRICANS	NON-CITIZEN ASIANS	TOTAL	MALAWIANS	NON-CITIZEN EUROPEANS	NON-CITIZEN AFRICANS	NON-CITIZEN ASIANS		
1 Top Management (Non-Technical)	168	90	75	3	0	485	78	345	3	53	653	8
2 Middle Management and Administration	1,143	905	192	8	38	1,578	807	532	5	234	2,721	70
3 Professional Occupations	453	142	297	2	12	600	72	485	6	37	1,053	39
4 Technical Occupations	10,008	9,622	347	3	36	2,129	1,058	438	9	624	12,137	300
5 Skilled Craftmen	6,649	6,635	14	0	0	10,223	7,879	1,869	239	236	16,872	402
6 Clerical and Other Office Workers	3,437	3,381	55	0	1	5,202	3,743	1,150	65	244	8,639	172
7 All Others	3,942	3,827	115	0	0	1,733	1,497	63	85	88	5,675	84
TOTAL	25,800	24,602	1,095	16	87	21,950	15,134	4,883	412	1,521	47,750	1,105

(Source: Manpower Survey 1971;68;1980)

be undertaken. Although a certain basic educational foundation may be provided in approximately ten years, more specific skills clearly require further training, with the result that the educational capital stock cannot be altered quickly to suit changing development requirements. Consequently, long-term educational planning horizons are required which must of necessity be closely aligned.

Linked to problems incurred through the long gestation period, is the difficulty for planners in assessing the returns to educational investment, and the extent of 'spillover' effects as discussed in Section 5.5.3. The fact that education may yield returns on investment for periods up to thirty years or more, is of particular significance in the consideration of the discount rate on productivity. As Meier (525;1976) states,

> ... since the useful life for competing investments tends frequently to be shorter, the relative case for investment in education is low if the appropriate rate of discount is high. Thus, the selection of the appropriate rate of discount is of particular importance in assessing the proper share for education in total capital formation. There being no developed capital markets which provide a clear indicator of this rate, its determination becomes essentially a matter of public policy. Investments should be ranked by a present value rather than an internal rate of return criterion. Moreover, there may well be a difference between the government's and the private investor's evaluation of present, relative to future needs. To the extent that public policy takes a longer view, it will also tend to require a large share for education in investment outlays.

Hence, further difficulties arise in national education planning with regard to the establishment of a suitable discount rate. The common procedure as outlined by Blaug (1976) involves estimating the future incremental earnings of the student, which are then discounted to obtain the present value. The present value thus obtained is then considered against the cost of investment in education.

There are though, basic problems associated with the implementation of such a technique. The procedure, of course, does not permit any assessment of the value of 'spillover effects' and external benefits of education to others apart from the individual receiving the education, and in a Third World context, such spillovers (as discussed in Section 5.5.3) actually do appear to contribute substantially to the development

process.

Related to the effects and measurements of the 'spillover effects', is the proposition that the returns to educational investment in the LDCs tend to be somewhat higher than in the developed nations. The reason for this situation is derived from the fact that the loss of productive time of persons engaged in education is not valued nearly so highly as in developed nations. However, in order to benefit fully from such a situation it is essential that educational output be closely correlated with the requirements of the economy so that the trained manpower can contribute effectively to national production.

5.6 CONCLUDING REMARKS ON THE IMPORTANCE OF EDUCATION IN THE DEVELOPMENT PROCESS

A number of factors thus point to the important role which educational planning can play in the development process. It is vital that short-term investments or recurrent expenditures within the educational system be kept in line with the long-term economic goals and in this light the role of co-ordinated planning becomes clear. This factor is further emphasised by Blaug (24;1876):

> The generation of 'balanced' growth requires a concerted effort to provide a chain of investments, thereby reducing the risk of individual investment and making it possible for an investment program to succeed where individual investments would fail....This necessity for investment planning exists even for investments which, given the necessary supply of entrepreneurial talent, would be appropriately undertaken privately. It exists par excellence for investment in education. Left to household decisions, neither the market knowledge, foresight or financial requirements are present which are needed to secure adequate supplies. This is especially the case in LDCs where the whole attitude towards education has to overcome conventional barriers and become reorientated to the development process.

With the important role of education in the development process clarified, attention increasingly turned to the formulation and introduction of models of educational planning, and the importance of investment in 'human capital'. In line with earlier applications of the Cobb-Douglas production function framework (Section 5.1.1), further attempts were made to assess the increase in output attributable to improvements in the 'human qualities' made by expenditures and investments in the areas of

education and training.

Indeed, consideration of the role of investment in human resources in the capital formation process as a whole is considered by some (Meier 1976, Schultz 1968) to be one of the key factors accounting for the huge differentials between the advanced nations and LDCs. (Section 5.1).

A variety of educational planning models have been applied in the Third World nations with varying degrees of success. Among the most notable models have been the Manpower Planning approach, the Social Demand Approach, the Tinbergen-Correa Model, and more recently Cost Benefit Analysis and the Linear Programming Approach. While none of these models have proved to be a panacea to all the problems inherent in educational planning, each has contributed in various significant ways to the advancement of knowledge in this area. Hence, it is pertinent when evaluating the position of educational planning in Third World countries, and in the search for the most appropriate educational planning framework for Malawi, to provide a resume and critique of the major models.

5.7 EDUCATIONAL PLANNING MODELS

5.7.1 The Manpower Planning Approach

The manpower planning approach to educational planning has possibly been the most widely applied model in both 'advanced' and Third World countries, and indeed, is the only planning framework which has been applied to educational development projections in Malawi, the country of particular import in this study. This approach has possibly been granted such attention due to the concern it places on the appropriate allocation of what are presumed to be scarce financial resources. Thus, the primary purpose of the manpower planning approach is, as Cohn (316;1979) points out, to promote productivity in the nation by correlating expected demand for particular skills with available supply. The approach thus proposes to derive the desired level and pattern of expansion in each sector of the educational system that will be required at the present time to train manpower for future needs, given the projected growth target for each sector of the economy in future years, and

the projected growth rate of the economy at large, normally according to a structured medium- and long-term development plan.

5.7.1.1 The Steps in the Implementation of the Manpower Planning Approach

Dasgupta (103;1980) outlines the steps typically involved in such a process:

a) An 'inventory' of manpower, classified by industry, occupational and educational attainment, must be prepared for the base year.

b) An estimate of the total employment levels of each sector of the economy for the target year must be formulated. Such estimates are derived from projected levels of output and productivity in the nation at large. Typically, these estimations are made on the basis of straight-line projections from past economic performance. The unreliability of such projections, even in an advanced nation, is such that the issue hardly warrants further discussion. Hence, in a LDC where the pace of economic growth is expected to be particularly rapid, the use of such projections indeed have questionable validity, and should be used with great caution. Nevertheless, if future employment levels are to be estimated, the absence of any other indicators of growth potentials, necessitates reliance on this method.

c) Within each sector of the economy, it then becomes necessary to allocate the estimated employment levels to the various occupational categories for the target year. While such allocations necessarily involve an estimation of future occupational distributions, the difficulties of carrying out such a procedure, particularly in a country experiencing rapid industrialisation and change are enormous. Once again, reliance must be made on straight-line projections based frequently on the performance of other countries which have experienced a similar stage of development in the past.

No matter what methods of projection are employed however, the impossibility of estimating future requirements of manpower in every occupational category are obvious. While such estimates can afford to be somewhat loose for jobs at the lower end of the occupational scale, where considerable substitution of skills is possible, there are clearly considerable difficulties involved in the accurate

calculation of numbers of highly skilled and specialised personnel.

d) From the estimated allocation by occupational category, the planner then derives the requirements by educational attainment for each sector or category. This yields the planned requirements or 'demand' for manpower with each type of educational qualification. Once again, however, there are a number of difficulties involved in carrying out this stage of the manpower planning process. As Dasgupta (1980) points out, even in specific occupational category, there are included a wide range of jobs, which typically differ substantially in terms of the necessary preconditions of educational requirements and training. Moreover, with economic advancement and technical changes typically occurring in the LDC, the content of the jobs is likely to change considerably, and hence the educational requirements.

The position as regards the formulation of Manpower Plans is likely to be further confused by the possibility of considerable levels of substitution between different occupational categories. Moreover, the educational requirements considered necessary for each occupational category, may in fact be quite flexible; the role of on-the-job training, apprenticeships and adult education must be taken into account in any calculation of manpower needs. It must also be borne in mind in this regard, that it is quite possible that education 'requirements' for a specific occupation will vary with the availability of educated manpower to fill such posts. As Cohn (319;1979) suggests,

> what employers may consider as 'essential' may depend to a large extent on what type of manpower is available. It is argued that upgrading of the labour force, in terms of educational qualification is likely to occur when the supply of educated manpower is increased relative to the demand for labour.

Eckaus (1964), in an attempt to link educational requirements with specific occupations in a more flexible manner and thus overcome some of the problems incurred in this step, proposed two measures of educational attainment, one being general educational requirements (GED) and the other, specific vocational training (SVP). The measurement involves relating each specific job category to GED

requirements according to number of school years required. Similarly, each job is then ranked according to SVP categories, these being interpreted in terms of number of years training. Eckaus (1964) thus posits that given the GED and SVP requirements for the various jobs, manpower forecasts and requirements may be quite adequately translated into training requirements.

While Eckhaus' approach has generated considerable interest, several other approaches have also been suggested, the most notable of which involves carrying out a survey in order to gather a sample of information regarding employees of the firms and industries within the nation. Details are thus gathered relating to hiring standards, educational qualification required for various posts, on-the-job training schemes, etc. Although such a survey yields all the information required if a manpower forecast is to be made, it clearly involves considerable expenditure, and must be updated at frequent intervals.

Moreover, the implementation of any of the above approaches necessarily requires that the average productivity of trained labour in each occupation must also be known, if estimates are to be made regarding future levels of output and related growth rates in GNP. Clearly, the measurement of future levels of labour productivity poses particular problems, but a number of approaches have been suggested, as outlined by Cohn (317;1979):

- Future labour productivity levels could be assessed according to the average productivity attained in another country with a similar level of GNP. Alternatively, productivity could be assessed according to productivity levels of the most progressive industry in the country.
- Another method of calculating future levels of labour productivity could be to observe past trends in labour output and then use these to extrapolate future output.
- The third suggested approach is to survey industrial estimates of productivity changes and manpower needs based on given assumptions concerning future market conditions.

e) The next step in the manpower planning approach involves an estimation of the supply of labour of each educational category that should be available in the target year, given the present stocks and the net addition that would result in the intervening period from the existing educational system, after allowing for death, retirement, and emigration. Once the difficulties inherent in the earlier stages

of the manpower planning process have been accounted for, the steps involved in this process are relatively straightforward.

f) The planner then calculates the difference between the 'demand' and the 'supply' of each type of manpower for the target year as given in steps d) and e) respectively. This gives the changes in supply that would be required in the target year to achieve balance in demand.

g) The final step in the process involves the computation of the enrolment in each level and branch of the educational system that would be required in each successive year up to the target year in order that changes required to achieve desired quantities of skilled and trained manpower may be achieved.

While the information to be obtained by means of a manpower planning approach is clearly highly desirable, and of great benefit to the formulation of educational policy in any Third World situation, the difficulties inherent in such an approach are multitudinous. However, as Dasgupta (105;1980) points out

> ... to derive rational educational policies from manpower requirements is clearly not easy. However, to derive such policies without them is impossible. Nearly all operational decisions on education involve estimates of manpower requirements, whether or not the estimates are explicitly made. The question is whether such estimates should be formal and systematic or ad hoc and piecemeal.

5.7.1.2 The Application of Manpower Planning Techniques to Educational Planning in Malawi

The manpower planning model was evaluated by the Ministries of Labour and Education in Malawi, as being the most appropriate method of 'systematically' evaluating Malawi's future manpower requirements, while also establishing which areas of the educational system should undergo expansion in order to meet projected manpower needs. The Statement of Development Policies of 1971-1980 (1;1971) drew attention to the need for careful evaluation of the stock of trained manpower in the assessment of the development potentials of Malawi in 1971.

In fact, the shortages of HILMP existing in the country at this time, (as discussed in Chapter 2), were presenting severe constraints to the attainment of Malawi's development objectives, and while statistics on fixed capital formation, and numbers in wage employment were freely available, no reliable data had been assimilated on HILMP availability prior to 1971.

The requirement was for a model which would in the final instance provide as comprehensive a survey as possible of the current and desired future employment levels of HILMP. The assumption was that the basic training required for entrance to the categories of high and intermediate level manpower was at least some secondary school education, the provision of which in Malawi in 1971, was on a very limited basis. Hence, the further requirement of the approach adopted, was that it should provide

> some economic and manpower perspectives for the Ministry of Education's development plans... while enabling the Ministry to forecast future levels of employment demand for the products of the educational system, thus indicating the required areas and magnitude of expansion in enrolments. (Manpower Survey;1;1980).

The choice of the Manpower Planning approach as the most appropriate planning model by the Ministry of Manpower and Social Services, was dependent upon a number of other factors, as outlined in the Manpower Survey Report (36;1980):

a) The present stage of development of the nation. It was felt that in an evaluation of the usefulness of the manpower planning model for developing economies such as Malawi's, the approach had been widely used in other Third World countries, and therefore that "in the case of developing economies, there are certain basic economic characteristics which are sufficient to justify a rther loose application of a generalised model for manpower planning." (Manpower Survey 36;1980). While such factors do not necessarily increase the validity and appropriateness of the model, the assumption was, that since it had met with some degree of success elsewhere and particularly in Britain, it would be similarly successful in Malawi's instance.

b) The prevailing degree of interdependence among the various sectors of the economy which were assumed to be largely co-ordinated and interdependent.

c) The relative size of the sectors comprising the economy, which in Malawi's instance were comparatively small.

d) The relative distribution of the supply factors, and the possibility of their quantification.

The appropriateness of the model was further substantiated on the grounds that it assumes a close functional relationship between HILMP availability and GDP. Thus, projections of growth in GNP and GDP derived from the Statement of Development Policies for 1971-80 provided a sound and established basis upon which projections of future manpower requirements could be formulated and assessed. Hence, the model was considered valuable in that it permitted a close co-ordination and systemic planning framework to be established for the economic functions of the nation at large. At the same time however, close reliance on the proposals contained in the Statement of Development Policies also had the drawback that it did not permit projections beyond 1981, since no reliable projection of growth rates in GNP and GDP beyond that year were established. This meant that projections of future manpower requirements, and needed expansion of the educational system were limited essentially to a ten-year planning phase, a comparatively short period in view of the lengthy gestation period of educational training for HILMP.

As has been pointed out, the collection of statistical data regarding the differing levels of employment of the various public and private industries, and the associated educational training required of such manpower is a costly and time consuming venture. In the Manpower Survey of 1971 due to resource limitations, the majority of the data was collected by means of mail questionnaires sent to private industries and the Government Staff List, which enumerated employees in the public sector. While mail questionnaires did reduce the cost of the collection of such data, it did however, also mean that returns from the industries and business concerns were not guaranteed, and that a low rate of return could adversely affect manpower projection attempts. Fortunately however, of the 840 questionnaires sent, 17 were discarded as the businesses were no longer in operation, and the remaining 823 returns yielded 672 usable returns, resulting in a response rate of 81.7%, as evidenced in Table 5.2.

Table 5.2 PERCENTAGE RESPONSE RATE BY ISIC GROUPS

ISIC GROUP		QUESTIONNAIRES DESPATCHED	USABLE QUESTIONNAIRES	RESPONSE RATE
1 and 2	Agriculture, Forestry, Fishing, Mining and Quarrying	204	176	86.3
3	Manufacturing	136	119	87.5
4	Electricity and Water	6	6	100.0
5	Construction	57	46	80.7
6	Wholesale, Retail, Garages Hotels and Restaurants	138	93	67.4
7	Transport, Storage and Communications	27	27	100.0
8	Business and Financial Services	54	41	75.9
9	Community, Social and Personal Services	201	164	81.6
TOTAL ALL GROUPS		823	672	81.7

(Source: Manpower Survey 1971; 6; 1980).

This return rate was deemed adequate for evaluation of the manpower situation and future requirements.

5.7.1.3 The Adoption of ISCO Coding and Related Difficulties of Application

The formulation of the questionnaire posed a number of difficulties in the implementation of the manpower model, particularly with regard to establishment of the differing occupational categories into which existing manpower was to be categorised. Seven broad occupational categories were adopted, mainly on the basis however, of the occupational coding suggested in the 1968 edition of the International Standard Classification of Occupations (ISCO). It was however, recognised that this classification was not appropriate to a developing country with an economy such as Malawi's, being heavily oriented to the situation found in heavily industrialised nations. Consequently a number of modifications had to be made in the classification which did not always result in great clarity of occupational specifications. The use of the ISCO coding was justified however, on the ground that it "facilitates both domestic and international comparison, and also ... because of its ready availability." (Manpower Survey 3;1980).

In view of the problems associated with the use of the ISCO coding it is appropriate to examine this coding and the seven occupational categories and assess the reliabilities of extrapolations of future manpower requirements made on this basis.

CATEGORY 1 : Top Management

This category was designed to include only those individuals in positions of 'top management' - i.e. non-technical managers involved in 'policy making'. While it is clear that every private business organisation must, of necessity, have at least one person engaged in 'policy making', due to the varying sizes of private enterprises, and the fact that some were of a singularly small-scale, the inclusion of top executives in this category became a somewhat more subjective matter.

'Policy makers' of the smaller enterprises were classified under Category 2 (Middle and Junior Management) because it was felt that the complexity

of their organisational undertakings did not warrant such a high level of skill. Further exclusions from Category 1 were made on the basis of salary scales of earnings of less than K2 000 per annum and were included as a 'policy maker', which meant that quite a large number of individuals recorded in the questionnaire as Category 1 were transferred to Category 2, although no reason for choosing the K2 000 level as a 'cut off' point was given.

In the Government sector, inclusion of personnel into Category 1 became even more fraught with complications. While posts in the 'superscale', administrative and executive grades were deemed possibilities for inclusion into Categories 1 and 2, a large proportion of the posts in the 'superscale' category were found to be 'professional or technical' in nature, and thus needed to be included in categories 3 or 4 rather than Category 1. Eventually, very few government officials were considered to be 'policy makers' and were included in the survey as such.

CATEGORY 2 : Middle and Junior Management

Middle and junior managers and top executives of small enterprises were included in this category, along with certain 'supervisory' positions. Supervisors engaged in agricultural occupations were however, excluded from Category 2 on the grounds that the ISCO definition of supervisors included only those individuals involved in the supervision of other 'skilled' workers. Supervisors in agricultural spheres were thus classified in either Categories 4, 5 or 6.

CATEGORY 3 : Professional Occupations

Inclusion in Category 3 was dependent upon the possession of a university degree or equivalent qualification, and generally included those in medical, engineering, accounting fields and the like. A number of difficulties were however experienced in deciding upon inclusion in this category. As the Survey (4;1980) points out, "The numbers recorded here overstate the presence in the current labour force of those whose principal function is the exercise of professional skill, because a number of managers needing professional backgrounds are recorded in this category."

Moreover, difficulties were encountered in determining which positions encompassed professional, sub-professional or technical skills on the basis of the information obtained through the mail survey. Consequently, categorisation was undertaken on the basis of salary data, a somewhat dubious measurement criterion in view of the implementation of a Wages and Salaries Policy in some sectors of the economy, and not in other areas where internationally competitive salaries were paid.

CATEGORY 4 : Technical Occupations

Inclusion in Category 4 was extended to all occupations below the professional category, but above the level of the skilled craftsmen and artisans of Category 5. Once again, the type of information obtained from the mail survey made it difficult to categorise jobs in either Category 4 or 5, and reliance was once more placed on salary data. The use of salary data as a cut-off point was again, however, of questionable value, due to the fact that shortages of trained craftsmen had in many cases resulted in their wages being pushed up to the technician level.

CATEGORY 5 : Skilled Craftsmen and Artisans

Sub-technical occupations were included in this category along with a number of other occupations not typically regarded as 'artisan', e.g. agricultural field assistants, social and community workers, etc.

CATEGORY 6 : Office Workers

This category was relatively all-inclusive of general office clerks, bank clerks, stenographers.

CATEGORY 7 : All Other Occupations

This was a residual, and all-encompassing category for occupations which did not fit in any of the previous six categories, but which still required at least two years of secondary education as a basic minimum.

Even a cursory assessment of the system of occupational categorisation used in Malawi reflects the difficulties inherent in carrying out Man-power assessments and projections in a LDC where the economy is composed

of enterprises in various stages of sophistication and development, and moreover, where occupational specifications are not clear. The follow-up surveys to the questionnaire survey revealed furthermore, that a great deal of substitution of skills had taken place in both the private and public sectors where persistent vacancies occurred which could not be filled. Shortages in particular occupational categories would thus not necessarily be reflected in the survey in absolute numbers as is evident in Table 5.3.

Table 5.3 Posts Difficult to Fill - Malawi

ISIC Group	No. of Questionnaires	Response - Post Difficult To Fill	
		Number	%
1 and 2	169	43	25.4
3	94	30	31.9
4	6	5	83.3
5	51	17	33.3
6	111	40	36.0
7	20	10	50.0
8	43	24	55.8
9	178	56	31.5
Total	672	225	33.5

(Source: Manpower Survey 1971;29;1980)

One of the most problematic areas in the manpower survey concerned the reliability of making manpower projections and estimates in view of the non-response rate of the magnitude reflected in Table 5.2, which would result in a considerable underestimation of the HILMP stock in 1970/71 and moreover, result in an underestimation of future manpower requirements.

In an attempt to minimize this problem, an attempt was made to 'gross up' the survey data for non-respondents on the basic assumptions that:

a) With respect to HILMP density and distribution pattern, there are significant differences between establishments in the same size group but in different ISIC groups.

b) That establishments in the same size and ISIC group, tended to have an almost uniform pattern of HILMP density and distribution. It was concluded then that there was a direct relationship between the type of business activity and HILMP characteristics. (Manpower Survey 1971;9;1980).

It was thus assumed that the 'grossing-up' of the statistical information along such lines would help to minimize, if not remove, the defects in the statistical data collected.

5.7.1.4 Outcomes of the Manpower Planning Survey 1971

While it was realised that the results of the Survey, in view of the above factors cannot be accepted without due regard to the limitations and questionable reliability of manpower supply and demand, characteristics of the economy revealed through the Survey are useful indications of the educational and training spheres which warrant greater investment and attention. The existing vacancies in the three broad occupational categories were recorded as 1,105 or 2.3% of total HILMP employment as a result of this survey, as is revealed in Table 5.3 overleaf. Such vacancies, to all intents and purposes, reveal a satisfactory manpower situation. But as the Manpower Survey points out, these results cannot be taken at face value for two reasons. In the first instance, employers responding to the questionnaire were requested only to list those vacancies existing at that time, and which they were actively trying to fill to ensure the effective functioning of their enterprise. In view of the common practice of substitution of skills and educational qualifications between jobs however, the actual shortage of appropriately trained manpower is likely to have been considerably underestimated.

The second reason why the results of the Survey fail to reveal adequately the actual manpower situation, is due to the fact that although recorded vacancies are low, the HILMP shortages become considerably more acute at the higher levels, with percentage vacancies of 4.5% at the senior level, 2.5% at the intermediate level and 2.1% at the skilled level (Manpower Survey 1971;15;1980) as reflected in Table 5.4 below:

Table 5.4 Vacancies - Malawi

Category	Number	HILMP Percentage
1 and 3 Senior Category	77	4.5
2 and 4 Intermediate Category	370	2.5
5 - 7 Skilled Category	658	2.1
TOTAL	1,105	2.3

(Source: Manpower Survey 1971;15;1980)

Shortages of skilled and trained manpower at the higher levels is of course of considerable import for Malawi in view of the fact that there is little possibility of substitutability of skills at this level. Moreover, reliance on expatriate personnel to meet these needs is particularly costly, and only a short-term solution to the problem. Shortages of manpower at these levels thus reveal a specific and urgent need for the training of Malawians in these skills.

The growing demand for manpower projected for the ten-years following the Manpower Survey of 1971 is reflected in Tables 5.5, 5.6 and 5.7.

Table 5.5 Cumulative Demand - Malawi

Period	Category 1 & 3	Category 2 & 4	Category 5, 6 & 7	Total
1970/71	1,783	15,228	31,844	48,855
1971/72	1,945	16,810	35,600	54,355
1972/73	2,123	18,547	39,740	60,410
1973/74	2,311	20,435	44,231	66,977
1974/75	2,516	22,490	49,212	74,218
1975/76	2,739	24,912	55,229	82,880
1976/77	3,035	28,878	65,187	97,119
1977/78	3,370	33,456	76,765	113,591
1978/79	3,722	38,740	90,433	132,895
1979/80	4,113	44,844	106,484	155,441
1980/81	4,547	51,897	125,329	181,773

(Source: Manpower Survey 1971;26;1980)

Table 5.6 Rates of Growth - Malawi
(Per Cent Per Annum Compound)

HILMP	1970-75	1975-80	1970-80
Categories 1 & 3	9.04	10.68	9.82
Categories 2 & 4	10.35	15.82	13.05
Categories 5, 6 & 7	11.65	17.79	14.29
Total HILMP	11.19	17.00	14.12
GDP at factor cost			
Total	7.2	8.5	7.9
Monetary sector	9.8	11.0	10.4

(Source: Manpower Survey 1971;26;1980)

Table 5.7 Net Incremental Demand for HILMP - Malawi

Period	Category 1 & 3	Category 2 & 4	Category 5, & 7	Totals
1971	162	1,582	3,756	5,500
1972	178	1,737	4,140	6,055
1973	188	1,888	4,491	6,567
1974	205	2,055	4,981	7,241
1975	223	2,422	6,017	8,662
1976	314	3,966	9,958	14,238
1977	317	4,578	11,578	16,473
1978	352	5,284	13,668	19,304
1979	391	6,104	16,051	22,546
1980	434	7,053	18,845	26,332
	2,764	36,669	93,485	132,918

(Source: Manpower Survey 1971;28;1980)

The survey thus revealed that during the decade

> an additional 132,918 persons, or nearly three times the 1971 stock of manpower will need to be added to HILMP; over one half of them in the last 3 years. Of this total 2% will be in categories 1 and 3, 28% in categories 2 and 4, and the remaining 70% in categories 5, 6 and 7. Compared with the proportion in the 1971 stock of 4%, 31% and 65% respectively, the greatest relative demand will occur at the skilled level. (Manpower Survey 1971;18;1980)

In an evaluation of this situation however, the Survey reported that shortages in these areas did not present problems of undue magnitude and in fact, stated that in view of the fact that

> 80.9% of the overall 'shortages' in 1975/76 and 76.5% in 1980/81 (were likely to) occur in categories 5 to 7, (a shortfall of approximately 68 000 personnel) ... this simply reflects the need to raise the proportion of children in the 15 to 19-year age group receiving secondary school education to approximately 9% in 1975 and 18% in 1980, compared with the present (1970/71) enrolment of approximately 3%. (Manpower Survey 1971;28;1980).

Such recommendations did however, fail to accord sufficient attention to the financial costs involved in raising secondary school attendance by 15% in less than one decade. As the AID Action Memorandum (11;Project Paper 612-0201) points out "..... expansion at secondary level is clearly essential, but with the resources likely to be available, this can do little more than meet the demand for the higher categories of HILMP and in numerical terms can make only a tiny contribution to filling the gap at the skilled level." Thus, while increasing demand for trained and skilled personnel was reflected with some questionable degree of accuracy in the Manpower Survey, recommendations as to how the costs of meeting such demand were to be met were warranted virtually no attention whatsoever.

It is moreover, necessary that the growing demand for HILMP over the decade under attention be assessed in addition in the light of the supply projections of manpower issuing from the educational system. Comparison of the demand and supply projections should yield more adequate guidelines to educational planners of future educational needs and necessary expansions, than consideration of increasing demand alone. The cumulative and incremental supplies of HILMP are reflected in Tables 5.8 and 5.9.

Table 5.8 Cumulative Supply - Malawi

Period	Category 1 & 3	Category 2 & 4	Category 5,6 & 7	Total
1970/71	1,706	14,858	31,186	47,750
1971/72	1,813	16,145	33,606	51,564
1972/73	1,926	17,682	36,214	55,822
1973/74	2,047	19,270	38,848	60,165
1974/75	2,164	20,914	41,448	64,526
1975/76	2,308	22,673	43,934	68,915
1976/77	2,457	24,511	46,488	73,456
1977/78	2,604	26,345	49,007	77,956
1978/79	2,753	28,230	51,469	82,452
1979/80	2,903	30,233	53,915	87,051
1980/81	3,055	32,245	56,392	91,692

(Source: Manpower Survey 1971;29;1980)

Table 5.9 Net Incremental Supply of HILMP - Malawi

	Category 1 & 3	Category 2 & 4	Category 5,6 & 7	Total
1971	107	1,287	2,420	3,814
1972	113	1,537	2,608	4,258
1973	121	1,588	2,634	4,343
1974	117	1,644	2,600	4,361
1975	144	1,759	2,486	4,389
1976	149	1,832	2,554	4,532
1977	147	1,834	2,519	4,550
1978	149	1,885	2,462	4,496
1979	150	2,003	2,446	4,599
1980	152	2,012	2,477	4,641
Totals	1,349	17,387	25,206	43,942

(Source: Manpower Survey 1971;29;1980)

Comparison of the manpower demand and supply statistics however, reveal much the same situation as the consideration of future demand statistics alone. In Table 5.6 it was shown that demand for HILMP was expected to grow at a compound rate of 14.2%. Table 5.8 above, however, shows a growth rate of only 6.75% in the supply of HILMP; less than one-half the required increase in demand. The seriousness of this situation is evidenced in the cumulative demand and supply figures in Tables 5.10 and 5.11.

Table 5.10 Difference Between Annual Demand and Supply - Malawi

	Category 1 & 3	Category 2 & 4	Category 5,6 & 7	Totals
1971	-55	-295	-1,336	-1,686
1972	-65	-200	-1,532	-1.797
1973	-67	-300	-1,857	-2,224
1974	-88	-411	-2,381	-2,880
1975	-79	-663	-3,531	-4,273
1976	-165	-2,128	-7,404	-9,697
1977	-170	-2,744	-9,059	-11,975
1978	-203	-3,399	-11,206	-14,808
1979	-241	-4,101	-13,605	-17,947
1980	-282	-5,041	-16,368	-21,691
Totals	-1,415	-19,282	-68,279	-88,976

(Source: Manpower Survey 1971;30;1980)

Comparison of the demand and supply statistics also revealed that in many instances, it was in fact too late to affect the supply of manpower to fill posts at the senior levels, primarily because of the length of training required in the educational system. Moreover, since the possibility of substitution among occupations at this level is very limited there was recognition once again, of the need for continuing reliance on expatriate personnel, and the pursual of a relatively flexible external recruitments policy.

In view of the shortages of financial resources available for investment in the expansion of educational facilities, the most feasible means of counteracting the future shortages of HILMP were assumed to involve the qualitative, rather than the quantitative improvements of the educational system. It was proposed by the Ministries of Education and Labour, that assuming a continuing level of the 1971 output of approximately 30 000 Standard 8 primary school leavers,

> an improvement in the quality of senior primary instruction, which brought the average level of intellectual development nearer to the (then prevailing) Junior Certificate level would not only ensure that the demand for skilled personnel was adequately met, but would also lead to a general up-grading of the labour force with obvious benefits to the smallholder farming sector. (Manpower Survey 1971;33;1980).

Table 5.11 CUMULATIVE DEMAND AND SUPPLY SITUATION - MALAWI

Period	Category 1 and 3			Category 2 and 4			Category 5, 6 and 7		
	Demand	Supply	Difference	Demand	Supply	Difference	Demand	Supply	Difference
1970/71	1783	1706	-77	15228	14858	-370	31844	31186	-658
1971/72	1945	1813	-132	16810	16145	-665	35600	33606	-1994
1972/73	2123	1926	-197	18547	17682	-865	39740	36214	-3526
1973/74	2311	2047	-264	20435	19270	-1165	44231	38848	-5383
1974/75	2516	2164	-352	22490	20914	-1576	49212	41448	-7764
1975/76	2739	2308	-431	24912	22673	-2239	55229	43934	-11295
1976/77	3053	2457	-596	28878	24511	-4367	65187	46488	-18699
1977/78	3370	2604	-766	33456	26345	-7111	76765	49007	-27758
1978/79	3722	2753	-969	38740	28230	-10510	90433	51469	-38964
1979/80	4113	2903	-1210	44844	30233	-14611	106484	53915	-52569
1980/81	4547	3055	-1492	51897	32245	-19652	125329	56392	-68937

(Source: Manpower Survey 1971;30;1980).

The value of the manpower survey for Malawi as carried out in 1970/71 lies therefore, not so much in terms of its specific quantification of future demands and shortages in the supply of HILMP, for such statistical information clearly has somewhat questionable reliability. Its importance lies rather in the broad indications of areas of present and future manpower shortages. Such indications permit a general assessment of future manpower needs, and provides the guidelines for the planning of educational expansions and improvements where financial resources permit this. It is argued moreover (Cohn 1979) that the degree of rigidity and quantification demanded in the manpower planning approach is essentially unrealistic in an economic situation such as Malawi's, which is exceptionally vulnerable to exogenous factors such as fluctuating prices for raw materials, rises in the cost of raw fuels and oils, and the availability of foreign aid and grants, which really cannot be subjected to a detailed planning framework.

Indeed, the Ministries of Education and Labour in an assessment of the 1971 Manpower Survey admits that

> the level of refinement in the manpower planning is now widely accepted as a futile exercise...it is felt that given the impossibility of such detailed forecasting, the best alternative is to aim to provide for expansion (if indicated) with the maximum of flexibility to accomodate specific demands as they emerge, thereby substantially reducing the gestation period of education. The methodology should therefore be based on the principle of contingency or flexible planning which would permit the switching of resources with relative ease in keeping with the changing requirements of the economy. (Manpower Survey 1971;22;1980).

It may be argued however, that such an approach in contradistinction to the manpower planning model, does not constitute a formalised attempt to undertake planning at all, and that there is room for the examination of a variety of other educational planning models, and an estimation of their possible effectiveness in this situation, before a completely liassez-faire approach is introduced.

5.7.2 The Social Demand Approach to Educational Planning

The social demand approach, in contrast to the Manpower Planning model, focuses on the future demand for places in the educational system by the students themselves. Hence, in planning the future provision of educational facilities emphasis is placed on the private demand for education, rather than on the future demand for trained manpower by the public and private organisations, as is done in the manpower planning approach. Hence, as Cohn (320;1979) points out, the "... social demand approach is based upon the notion that planning should be used to affect the supply of educated manpower, irrespective of market demand. The approach would call for the projection of private demand for education, so that educational institutions may adapt themselves to the expected demand."

This approach to educational planning gained considerable import after it was recommended by the Robbins Committee on Higher Education (1963) for implementation in Britain, although it had already met with approval and support in the Addis Ababa Conference in Africa of 1961, and the United Nations Santiago Conference on Education in 1962. The major reason for its implementation in Britain, as in many of the African countries in the early 1960s, was due to the fact that it did not conflict with the growing concern over the issues of human rights, and indeed supported movements concerned with the provision of improved and equitable educational facilities to the populations of all nations. Indeed, this concern with human rights is reflected in the Robbins Committee's rationale for adopting this approach; that "all young persons qualified by ability and attainment to pursue a full-time course in ... education should have the opportunity to do so." (cited in Cohn; 321;1979).

The implementation of the social demand approach has however, a number of advantages over and above its obvious links with human rights movements. The assessment of future social demands for education would permit careful calculations to be made of future teacher training requirements, and physical capital outlays, while the industrial sector could be informed of future quantities of trained manpower and consequently, could determine whether the introduction of more or less capital intensive methods were necessary.

The problems associated with the implementation of the social demand approach have however, tended largely to outweigh the advantages, and have probably been the main reasons for Third World countries particularly turning to the use of other educational planning models which frequently do not correlate as closely as this approach with the concern for human rights. One of the major areas of concern is the fact that social demand projections rely very heavily on fluctuations in demographic factors and socio-economic variables. What this means is that the costs to the public of tuition, educational loans, etc., will be directly affected by governmental efforts to stabilize economic fluctuations, influence admissions levels, or any other type of governmental intervention in the economy. Hence with increases in the costs of education, it is logically concluded that the demand for education will decline, or alternatively that increases in socio-economic welfare will be correlated with rising demands for education. The danger of projection in this planning process thus lies in the fact that single factors, e.g. levels of wealth, are used to project future social demand. The tendency is to neglect to consider extraneous variables which may well have a profound effect on levels of demand.

Cohn (322;1979) moreover, lists further reasons for not employing a causal model such as this:

> Economists are not in full agreement as to what constitutes a 'correct' causal model, and even if a 'correct' model can be formulated, there is a lack of data to implement it, especially in regard to future years - i.e. in order to predict enrolments in the years hence, it is necessary first, to project the levels of the explanatory variables (parental income, education, rates of employment etc.) years into the future. That may be an impossible task.

The most convincing argument against the social demand approach is however, voiced by Blaug (1967). He posits that it is not really desirable to provide educational facilities to all who demand it, mainly due to the fact that job vacancies may not necessarily be available for all graduates in all educational spheres, and hence, the marginal social benefits derived from education, may not exceed the marginal social costs incurred. Moreover, an excess of HILMP gives rise to unemployment or at least underemployment of educated manpower, a situation which has caused a number of LDCs, including India, considerable social problems.

The social demand approach to educational planning, while having some beneficial aspects for the advanced, wealthy nations, thus has few benefits if applied to the poor nations such as Malawi. Indeed, financial limitations are such in Malawi, that it would be simply impossible to provide educational opportunities to meet social demands, and consequently, this approach warrants only limited attention in this instance.

5.7.3. The Tinbergen-Correa Model of Educational Planning

Perhaps the major criticism concerning the application of the Manpower planning model in Malawi's instance, was the fact that the approach relied heavily on the availability and formulation of specific statistical information. Typically, however, many of the poor, under-developed nations fail to have any reliable statistical data which may be utilised in such manpower projections, and hence Tinbergen and Correa proposed a simpler model to educational planning in 1962.

The model assumed the existence of an adequate supply of persons receiving primary education, as indeed is the case in many of the LDCs, Malawi included. Attention is then focused on the provision of secondary and higher levels of education, the desired numbers of people being trained to this level, being assumed to be proportional to national income.

Consequently, projected increases in the provision of educational facilities must be closely correlated with projected growth of GNP over the same period, as is done in the manpower planning approach and the social demand model.

While the simplicity of this model has led to its implementation in a number of nations its appeal has generally been relatively short-lived. As with the social demand approach however, financial restrictions are frequently so severe in the LDCs, that the possibility of incurring expenditure on the training of personnel in fields where there is little demand, leads planners to turn to the more specific technique of Manpower planning.

5.7.4 The Linear Programming Approach to Educational Planning

The Linear Programming Approach to Educational planning was largely developed in response to the shortfalls experienced in the implementation of the Manpower Requirements approach, while attempts were simultaneously undertaken to relate educational planning more closely to growth objectives determined for the economy at large.

Early applications of this approach were undertaken by Adelman (1966) for educational planning in Argentina and Bowles (1967) in Nigeria. In both instances, the purpose of educational planning and ultimate educational expansion, was seen to be the acceleration of the economic growth of the country at large. Adelman, (cited in Cohn 331;1979) to this end, thus proposed three major growth objectives for the economy of the nation under consideration:

- Maximize the discounted value of GNP over a given horizon
- Maximize the growth rate of the economy
- Maximize the discounted sum of net foreign capital inflow.

Accordingly, the economy is divided into a number of potential "growth" sectors, one of which is naturally an education sector. Effective planning techniques should assist in the maximization or minimization of a determined linear objective function with each of the growth sectors. Each growth sector will however, be characterized by a set of linear constraints, including such factors as initial availability of resources, social and technological factors.

In the application of the linear programming approach to educational planning, expenditure in the education sector is thus treated in a manner entirely analogous to investment in real capital. Hence, the objective function in both Bowles' application of the model to Nigeria, and Adelman's to Argentina, is of the standard 'national income' type. Hence, the extent to which expansion of the educational system is seen to contribute to future national income is measured by the NPV of the life-time earnings attributable to additional years of education.

The outcome of the Linear programming approach to educational planning should be the assessment of the optimum values of the decision variables.

Thus, in terms of educational planning, the approach should ideally yield information on the optimum enrolments to be undertaken at each level of the educational system during the planning period. Consequently, the long-term outcome should be a supply of suitably trained and skilled manpower within the country, such that economic growth objectives may be achieved. The approach should, moreover, provide relevant policy guidelines for sectors of the economy other than education, if the model has been effectively implemented.

However, while Bowles' (76;1967) application of this model to Nigeria yielded important information on education planning, Adelman's use of this approach to plan four five-year periods in the Argentinian economy yielded rather various results. Cohn (331;1979) for instance, reports that the approach indicated that only university graduates or dropouts should be trained while commercial and vocational schools were seen to play no part in the optimal school network. While these results may in part be the consequence of Adelman's usage of available data (she assumes rather unrealistically for instance, that the productivity of university graduates is three-and-one-half times that of secondary school graduates), several difficulties exist in the general application of the model.

Perhaps the problem most likely to be incurred in the application of this model concerns the ready availability of appropriate data, particularly in the case of the Third World nations. Cohn (332;1979) moreover, points out a further criticism that the approach "makes no attempt ... to assess the sensitivity of the solutions to marginal changes in the co-efficients of the relations." While Fox and Sengupta (676;1968) suggest that this drawback be overcome by computing in addition to the optimal solution, the second and third best alternative, once again, problems are likely to be encountered in the data collection process necessary to carry out such calculations.

Due to such drawbacks, the Linear programming approach has then been implemented in only a few instances, and with questionable success. The requirements for exact quantification of all variables has thus limited its implementation in LDCs, and for this reason alone, it is considered inappropriate for application to educational planning requirements in Malawi.

CHAPTER 6

THE APPLICATION OF THE BENEFIT COST ANALYSIS FRAMEWORK OF EDUCATIONAL PLANNING TO THE PROBLEM OF OVERCOMING SHORTAGES OF TRAINED AND SKILLED MANPOWER IN MALAWI

6.1 INTRODUCTION

In Chapter 4 extensive consideration was given to the current availability and shortages of trained manpower (HILMP) in Malawi and the hindrance such a situation presented to the pursuit of development plans and objectives within the nation. Current shortages of HILMP were identified in all seven ISOC levels. (Section 4.2.2).

Chapter 4 also pointed to the future requirements and potential shortages of skilled manpower at all levels, but identified in particular the need for manpower qualified at secondary school level and trained to fill "intermediate" skill levels. It was ascertained that unless substantial efforts were made to provide for future personnel requirements at these levels, Malawi was likely to experience severe shortages of manpower at the intermediate ISOC levels. Such shortages were likely not only to pose considerable problems to the attainment of development plans, but also to present a serious drain on the country's financial reserves since reliance would have to be placed on the retainment of expatriate personnel.

The current shortages and future requirements of HILMP in Malawi were assessed by means of a Manpower Planning Survey 1971 (Section 5.7.1). While such a Survey undoubtedly yielded pertinent and hitherto unavailable information regarding the actual manpower situation in Malawi, the technique was seen in Section 5.7.1.4 also to encompass a number of serious limitations and drawbacks which would undoubtedly restrict the effectiveness of the findings of this exercise. Moreover, while such a Manpower Plan provided invaluable information regarding the existing shortages of Manpower in the various ISOC levels, it provided little detailed information as to how such shortages were to be overcome or to what extent expansion of education and training facilities should be undertaken to provide for future manpower requirements.

Hence, the purpose of Chapter 6 is to investigate the ways in which Malawi might:

- obtain an adequate supply of HILMP in the future, such that the implementation of development plans is not impeded.
- improve the skill levels amongst its work force.

The examination of these two issues has in this instance however, been restricted to an investigation of the present shortages and future demand for engineers and engineering technicians, primarily due to limitations on time, but also due to a shortage of reliable data on which to base statistical calculations in various other occupational fields. Most importantly though, the field of engineering is an area experiencing particularly severe manpower shortages.

Chapter 6 will thus examine the alternative ways of overcoming the future (long-term) problems associated with the shortage of engineers and engineering technicians. The method which is used for elucidation of solutions is Benefit Cost analysis as applied to educational planning frameworks. The model that is set up represents a simplification of the variety of means by which engineers may be trained in Malawi and the costs involved in such training. The simplified model thus enables a series of Benefit Cost solutions to be set up and ranked.

Input data used in the simplified Benefit Cost model is based on the U.S. AID Report of an Engineering Manpower Survey of Malawi from January 1979 (No. AID/AFR-C-1132) and the AID Project Authorization Report of 1980 (AAA/AFR/DR). While the input data used in the Benefit Cost analysis is thus considered to be reliable and truly representative of the situation existing in Malawi, the application of the Benefit Cost analysis has required that a number of assumptions be made where extraneous variables have been seen to have a possible effect on the solutions. Any such assumptions that have been made are detailed in the relevant sections. The purpose of the Chapter is thus to highlight the Benefit Cost Technique and its applications to the problem under consideration, rather than to focus exclusively on the reliability of the results obtained thereof. It is thus proposed that a Benefit Cost analysis could be of great value in formulating long-range manpower planning policies to overcome potential shortages of appropriately trained personnel.

6.2 THE THEORY OF BENEFIT COST ANALYSIS PROCEDURE

Benefit Cost analysis has been described as an 'objective way of making decisions' (Newton 17;1972) but a more general definition is given by Prest & Turvey (683;1965) - it is

> a practical way of assessing the desirability of projects, where it is important to take a long view (in the sense of looking at repercussions in the further, as well as the nearer future) and a wide view (in the sense of allowing for side effects of many kinds on persons, industries, regions, etc.) i.e. it implies the enumeration and evaluation of all the relevant costs and benefits.

It can be ascertained then, that the technique of benefit cost analysis should have particular application when applied to the formulation and determination of long-term plans and policy guidelines in the LDCs. As was pointed out in Chapters 1 and 3, the poor nations are in the situation whereby severely limited resources, such as labour at all skill levels, capital, land and other natural resources, foreign exchange and management skills, have to be deployed for use in stimulating growth in many areas of industry, agriculture, education, and public sector expansion. However, as Squire and Van der Tak (15;1981) point out, the rational allocation of these limited resources is not the final aim of the allocative process. The final aims of such deployment of resources focuses on the pursual of more fundamental objectives, in the case of the LDC's, the promotion of economic growth, the removal of poverty and an increased drive towards equality of opportunity in the nations.

The rational or optimal allocation of the scarce resources among the competing objectives is, as Caiden and Wildawsky (169;1974) point out, an extremely difficult exercise. The allocation of resources to one objective or plan (investment in industry for example) necessarily entails reduced expenditure in other areas (in this instance, possibly health and welfare, and agricultural development). Hence, the pursuit of one programme objective involves the sacrifice of objectives in other spheres. As Squire & Van der Tak (15;1981) state,

> a choice therefore has to be made among competing use of resources based on the extent to which they help the country achieve its fundamental objectives. If a country consistently chooses allocations of resources that achieve the most in terms of these objectives, it ensures that its limited resources are put to their best possible use.

The benefit cost analysis approach has been proposed as a suitable method to employ when there is this need to evaluate competing programme objectives and assess how best to allocate the limited resources available between the selected objectives. The basic premise of the benefit cost approach thus involves an assessment of the benefits and costs of a project and the reduction of the net figures to a common denominator. It is thus an attempt to do explicitly what the price mechanism normally would do implicitly, that is, to choose investment projects in order of their benefits per unit of costs. Should the costs of a project outweigh the purported benefits, the project is considered to be unacceptable, while if the benefits outweigh the costs, the programme is seen to represent the optimal allocation and utilization of available resources. Thus, in the assessment of the costs and benefits, the satisfactory common denominator will almost always be money. As Blaug (121;1976) points out, it is almost impossible to get away from prices as measures of costs and benefits of public sector activity, and yet these prices cannot be adopted uncritically. The solution to the problem, states Blaug (op cit.) is the adoption of the technique of cost-effectiveness into the benefit cost analysis, this being an approach which is concerned with the evaluation of all objectives whether economic or not, and the measure of "social welfare" attached to each objective. In the provision of welfare facilities such as education and health facilities the inclusion of cost benefit measures in the evaluation of alternative courses of action is necessarily impaired.

The application of the Benefit Cost approach is thus evidenced through the formula below which Cohn (95;1979) posits will provide an adequate measure of change in "social welfare"

$$\Delta W^* = \sum_{t=1}^{T}\left[\sum_{j=1}^{n} \Delta Y_j t/(1+i)^t\right]$$

Where: T = Time passed
$\Delta Y_j t$ = change in returns received by nation or individual i at time t.

The real value of the Cost Effectiveness approach thus lies in the fact that it permits some evaluation of the "social profit" or "social costs" connected with differing programme alternatives. For the more 'precise' concept of revenue or revenue flows, the benefit cost analyst substitutes the less precise, but more meaningful concept of "social benefit". Financial analysis of project alternatives which has been the method of evaluation most frequently used in past programme or plan

determination, tended only to assess the financial profits or costs involved, and as such, failed to adequately assess the effects of a project on the fundamental objectives of the nation at large. Although financial costs are generally the most prominent and readily apparent feature of plan proposals, failure to adequately assess the social profits or costs involved can have severe long-term repercussions for the attainment of "balanced growth objectives". The Benefit Cost approach, in its calculation of "social welfare" and redistributional effects of projects, thus takes cognizance of the fact that what could count as a benefit or a loss to one part of the economy, or to one group in society - does not necessarily constitute a benefit or loss to society as a whole. Nonetheless, while such factors are taken into account, the concern in the analysis is with the economy as a whole, or with the society as a whole, not any smaller part of it.

Hence, as Mishan (11;1972) points out, if the benefits of a project or programme are to be measured in terms of profit to a particular group, it is not forgotten that "spillover" effects of the project in the form of benefits or costs, will accrue to a large number of people or groups other than the shareholders. These "spillover" effects are measured through the use of shadow pricing techniques. The holistic approach thus implied in the Benefit Cost approach is evidenced in the fact that

> the economist engaged in the Benefit Cost appraisal of a project is not, in essence, asking a different sort of question from that being asked by the accountant of a private firm. Rather, the same sort of question is being asked about a wider group of people - who comprise society - and is being asked more searchingly. Instead of asking whether the owners of the Enterprise will become better off by undertaking this project rather than not undertaking it, or by undertaking instead any of a number of alternative projects. (Mishan 11-13;1972).

It is thus proposed that the application of Benefit Cost analysis to educational planning can assist in the formulation of policy guidelines which are closely aligned to the major developmental objectives of the country, while adequately reflecting the need for any expansion within the educational system to provide for the nation's future manpower requirements.

6.3 BENEFIT COST ANALYSIS - ITS APPLICABILITY TO EDUCATIONAL PLANNING

As Blaug (126;1976) points out, in all nations, but more especially the poor countries, "the central principle of educational planning is to maximize returns, in some sense or another, from given amounts of resources devoted to education, or alternatively expressed, to produce at the lowest possible cost, whatever level of educational output is chosen as 'preferable'." While the importance of the adequate provision of educational opportunity in a nation is subject to little dispute (as discussed in Chapter 3), considerable controversy has arisen as to which spheres of education warrant the heaviest expenditure, and moreover, which spheres yield the most positive benefits for the nation as a whole. Such issues are clearly of considerable import for a nation faced with restricted financial resources, a limited stock of skilled manpower and a relatively unstructured educational system. The objective of educational planning is thus to isolate criteria for allocating the public budget efficiently between a variety of educational objectives, (for instance between the various levels of education, between formal and informal education, etc.) such that economic objectives are maximized. It is proposed that the application of Benefit Cost analysis techniques to such issues will reveal the required information.

It is thus assumed that economic growth is the maximand of educational policy, and while such propositions have met with considerable criticism (Balogh and Streeten 1963; Merrett 1966; Vaizey 1962, Chapter 3), it is asserted (Blaug 204;1976; Cohn 1979) that the direct economic benefits of education essentially provide the only accurate indication as to whether education is playing any positive role in the nation's move towards 'accelerated development'. The enumeration and quantitative estimation of the costs and benefits associated with the provision of education is thus deemed to be of paramount importance in the formulation of rational investment policies and in the setting of optimal policy decisions in this sphere.

The identification of the costs and benefits associated with the provision of varying levels and types of education facilities has also given rise to considerable difficulties of interpretation and measurement. Writers such as Schultz in "The Economic Value of Education"

(1963) Griliches (1970) and Wise (1975) have formulated a variety of means by which to assess the benefits of education; the Simple Correlation approach, the Residual Approach and the Returns to Education Approach. The estimation of "costs" of education has proved no simpler due to the categoriation of direct and indirect, and imputed costs.

Nonetheless, the importance of the evaluation of returns to investment in education by the governments of poor countries can clearly not be understated. Hence, attention had focused on establishing the most effective means of evaluating and quantifying the costs and benefits. Dasgupta (99;1980), in this regard, posits that the costs to society of various educational policy alternatives are in fact relatively simple to estimate. Among such costs, Ketkar (301;1977) includes the investment in buildings and equipment and other capital expenditures, teachers' salaries and the social opportunity costs of students' time, represented as earnings foregone, as calculated according to Schultz's approach (1960). In estimating the social benefits associated with increased educational opportunity, it is general practice to estimate such benefits in terms of changes in the before-tax incomes of individuals classified by age and education level attained. The conclusion derived is that any differences between the incomes of people in each age group with varying levels of education are attributed in large part to their further education. The projections of such differences in incomes over the expected working life of the individuals concerned should rightly yield a time-stream of the economic benefits derived from further education. From the time-stream of costs and benefits of education the Net Present Value (NPV) or internal Rate of Return on investment in education can be calculated, thus permitting an evaluation of the advantages of investment in education as opposed to investment in alternative sectors in the economy. An individual's incremental earnings can be taken to represent the added social output generated by investment in this education. The evidence in modern economies shows that personal earnings are positively correlated with the level of education, and the simplest explanation is that the better educated are more productive than the less educated, presumably because of the knowledge they acquired in schools and universities, and such conclusions would be borne out by Ketkar's (302;1977) findings on

Earnings at Different Levels of Educational Attainment in Sierra Leone. (Table 6.1).

Table 6.1 : Earnings at Different Levels of Educational Attainment

in Leones per year

Educational Attainment	Median Income		Starting Salary
	Pre-1970-1	Post-1970-1	Post-1970-1
None	260	292	-
Primary	390	439	243
Secondary/Tertiary	840	884	607
University	2 664	2 731	1 436

(Source: Ketkar 302;1977)

The acceptance of this explanation of the higher earnings of the educated is critical for the Application of the Benefit Cost Analysis approach to educational planning.

It is on the basis of such calculations of the Costs and Benefits of education at various levels that an appropriate evaluation of the social returns to investment in education can be assessed. An increasing number of attempts have been undertaken in the poor countries, in line with such assumptions, to evaluate the social returns to education, many of the studies in Africa revealing results similar to those found in Sierra Leone where returns to primary, secondary and higher education were found to be in the order of 20%, 22% and 9.5% respectively. (Ketkar 1977).

Analysis of such social return figures has led planners in these nations to the conclusions that the greatest shortfalls in manpower requirements are to be located at the middle skill levels, while the greatest returns to investment are found to be at secondary school level, an area of the education structure which has not attracted heavy investment in past plans, attention being focused on the provision of universal primary education and university or higher education. (Sections 3.1 and 3.2). The calculation of social Rates of Return for Kenya, as undertaken by Thias and Carnoy (1972) revealed in this regard that primary education and secondary education yielded a greater return (34% and 38% respectively) to investment than tertiary or university education (9% rate of

return). Once corrections for mortality, socio-economic variables etc. are taken into account it would appear that the completion of secondary education yielded higher returns to investment than expenditure in any other educational sphere.

The application of Benefit Cost analysis techniques to educational planning has yielded important results to rate of return estimations in a variety of related educational spheres. One such area concerns the relevance of the inclusion of agricultural instruction in the school curricula of LDCs in Africa. It has been postulated (Balogh 1962; Dumont 1964) that since most African nations are largely dependent on agriculture, the primary means by which schooling can make a significant contribution to economic development is by "imparting the agricultural bias to the curriculum at all levels of the educational system." In consequence, the inclusion of agricultural instruction in the educational system became an integral part of many nations' development plans. While such an hypothesis would appear to be grounded on sound and realistic bases, it was found in many instances, Ghana being a notable example, that where such proposals were implemented they met only with rejection by the native population. Foster ("The Vocational School Fallacy in Development Planning" (1974)) in an extensive study of this situation in Ghana revealed that the population chose to continue to favour academic education along Western lines. Application of private and social rate of return analyses to an evaluation of the situation, revealed that the agricultural sector in Ghana provided few employment or advancement possibilities for the average youth in Ghana, and, as a result, the most favourable returns to educational investment were to be found in the European-dominated modern sector. Hence the continued demand for 'academic' tuition. Further analysis of the situation was important for its implications for future determination of the developmental objectives of Ghana as a whole. It was ascertained as a result of the Benefit Cost analysis, that the central problem lay not in the school system itself, but rather in the fact that the modern sector had not been expanded at a sufficient rate to create a demand for technical and academic skills. Hence, the Rates of Return analysis was of great importance in evaluating the private and social returns to investment not only in the educational sphere, but across the developmental objectives of the nation at large.

Possibly one of the most important advantages of the Benefit Cost approach as applied to educational planning however, is that it enables a considerable degree of flexibility to be accommodated within the educational system. Consequently, adjustments can be made at relatively short notice to cope with bottlenecks or surpluses of educated manpower which may arise within the country, permitting as Blaug (217;1976) points out, a smoother adjustment of the educational system to the labour market. The flexibility of the Benefit Cost approach to educational planning is further emphasised when American and British educational systems are compared. The British planning system requires that students must specialise at a far earlier age than in the American system, and in consequence, the future supply of specialists in numerous fields is already determined several years before the students enter the work force. The American system on the other hand, due to the flexibility built into the system by the adoption of the Benefit Cost method of educational planning, does not introduce specialisation into the system until the final educational years of the student, while vocational counselling and the provision of special student loans keeps students informed of changing trends in the labour market. The net result is that shortages or surpluses in most categories of skilled manpower can be overcome in as short a period as two years, with little adjustment in expenditure required. The essential differences of the Manpower Forecasting View of the World, and the Rate-of-Return Approach is evidenced in Chart 6.1 below.

Chart 6.1 : Fixed Versus Variable Coefficients

The Manpower Forecasting View of the World	The Rate-of-Return View of the World
1. Students acquire more education for consumption reasons.	1. Students acquire more education for investment reasons.
2. Students choose major subjects in ignorance of, or with no regard to, career prospects.	2. Students are well informed and attentive to career prospects.
3. All education is specialized and specialization starts early.	3. All education is general and there is no specialization at any age.
4. All input-coefficients in schools are fixed: complete indivisibility and specificity of teachers, plant and equipment.	4. All input-coefficients in schools are variable: complete divisibility and non-specificity of teachers, plant and equipment.
5. The demand curves for different skills shift discretely.	5. The demand curves for different skills shift smoothly.
6. Near-zero elasticities of substitution between skilled men.	6. Almost infinite elasticities of substitution between skilled men.
7. Near-zero elasticities of demand for different skills	7. Near-zero elasticities of demand for different skills.

(Source: Blaug 121;1976)

The Benefit Cost technique has also been applied with considerable success in determining the reasons for the existence of a large population of "educated unemployed" in India. The findings are of considerable import in view of the fact that such a situation is being found to occur more and more frequently in some LDCs, among them Korea, Argentina and Pakistan. India however, presents the most severe situation with a conservative estimate of approximately one half million Indian men with education being unemployed in 1967, this occurring despite the fact that matriculants constitute a mere 4% of the labour force, while the economy was showing a 3.5% growth rate per annum (Blaug 235;1976).

The application of Benefit Cost principles to an evaluation of such circumstances revealed that the private rates of return to education were in fact substantially greater than social Rates of Return, primarily due to the heavy subsidization of the costs of education to the individual by government. Hence, the social rates of return to secondary and higher education were far less than the rates of return to primary and lower secondary school education. The Benefit Cost

analysis revealed then, the need to lower substantially the private rates of return to secondary and higher education, possibly by way of charging the individual consumer of education higher fees. The outcome of such a move would be a decrease in the demand for higher academic qualification while students could be attracted to certain fields of study by means of student loan programmes or scholarships.

The technique of Benefit Cost analysis can thus be seen to have particular applicability in the evaluation of a variety of educational systems, and in assisting in the formulation of economically and socially rational educational plans. It is thus proposed that the incorporation of this technique in educational planning practices in Malawi, could lead to the establishment of an improved and more flexible system of education, such that the returns of investment in the educational spheres are substantially greater than those obtained by means of the application of the Manpower Planning framework.

6.4 THE IMPORTANCE OF TRAINED ENGINEERING MANPOWER IN MALAWI'S DEVELOPMENT OBJECTIVES

As has been discussed in Section 2.3.1, Malawi's development policies and objectives emphasise the importance of growth and improvement in the economic status of the rural small-holder farmer. In fact, growth of the economy at large is essentially dependent upon developments in this sphere. However, despite the high priority given to rural development, it has been found that efforts to stimulate the development of rural areas are being hampered, paradoxically by the shortage of skilled manpower to assist in this development process. As is pointed out in Section 2.3.1.2.2, and in the AAA Project paper (17;1980),

> Scarce supplies of technically skilled labour in Malawi is the most significant obstacle to efforts promoting equitable economic and social development... Despite the priority of the Government of Malawi given to rural development, without a skilled indigenous technological ability, all aspects of development and economic progress risk being ephemeral.

A similar situation has been experienced in Ghana where developmental efforts and expenditure focused almost exclusively on rural and agricultural development. The result of such a strategy was quite

contrary to expectations - the failure to invest adequately in the development of urban areas and the advancement of technological skills resulted in a severe shortage of manpower in this area, thus hindering the implementation of development projects across all fields. (Blaug, 1976).

The recognition in Malawi, of the existing shortage of skilled manpower and its consequent effects for development objectives, led to the conclusion that the "long term goal should be the improvement in institution building and the production of appropriately skilled manpower for such institutions. The one means for achieving this strategy would be to invest in appropriate projects in areas of education and human resource development." (Richards Report 1974)

At present, the occupational skill in greatest demand by both the Government and the private sector in Malawi is engineering. The demand for trained engineering talent however, exceeds greatly the country's indigenous supply, thus posing a significant obstacle to the attainment of development objectives in a number of spheres. Engineering services are essential in the construction of Malawi's infrastructure - in rural road project networks, where agricultural goods must be transported to market towns and later external markets, irrigation and hydro electric projects, rural electrification, low income housing schemes and health and education services, which at the present time are frequently inaccessible to rural dwellers. Construction in such areas is clearly related to the improvement of the living and working conditions of Malawi's rural population on which its development depends.

In line with its policy of emphasising rural development, stemming urban migration and encouraging cash crop production, the Government of Malawi has introduced a number of Integrated Development Schemes organised along the Moshov line (Section 2.3.1.1), three of which are in existence at the present time, while plans exist to create several more to accommodate a total of 180 000 farming families. Such schemes represent considerable capital investment on the part of the government and if they are to be successful, clearly require substantial inputs of technical expertise in their design, construction and maintenance.

The greatly increased rate of rural development has however, created such demands for engineering skills that insufficient graduates are entering the market. The Government and most private organisations have consequently relied heavily upon the recruitment of expatriate engineering personnel, a practice which necessitates considerably higher expenditure than the recruitment of local labour, should it be available. The high costs involved in the recruitment of suitably qualified engineering personnel dictate the need for Malawi to acquire its own technological and administratively trained personnel.

The importance of development in the modern sector of the economy is given further impetus by the burgeoning population (Section 2.11.7). The increasing demand placed on the limited land resources can effectively only be counteracted by increased employment opportunities in the urban areas. To date, migration to urban areas has been contained by the government's emphasis on the smallholder farmer, but success in this area is unlikely to continue as the population inevitably increases, and the importance of development of both urban and rural areas assumes greater significance.

In order to meet developmental requirements in these areas, Malawi has, as has been discussed, been forced to rely extensively on expatriate personnel, and it is estimated (AAA Report 10;1980) that up to 75% of the high level manpower employed in the country are expatriates, a large proportion of this expertise being comprised of engineering skills.

6.4.1 Manpower Survey Results - The Need for Qualified Engineers, Diplomates and Technicians

It is Malawi's experience in the implementation of its development plans, that shortages of suitably qualified engineering personnel are posing severe hindrances to the attainment of basic objectives. (Section 6.1). To pursue "development" effectively, suitable numbers of appropriately trained engineers are essential. It is evident however, that existing educational facilities in Malawi are not keeping pace with the existing and growing demand for such labour, and realisation of this fact led to a number of Engineering Manpower Surveys being conducted, namely the Richards Report, 1964. The U.S. AID/AFR-C.1132 Report of An Engineering Survey in Malawi, and the AAA AID Report on Expansion of Malawi

Polytechnic Engineering Facilities (1980).

These surveys also documented the current and projected extent of the dependence on expatriate personnel in addition to the large numbers of Malawian students receiving engineering training abroad. Tables 6.2, 6.3, 6.4 and 6.5 reveal the actual extent of the shortages of engineering skills, the heavy reliance on expatriate personnel and the growing numbers of students studying abroad.

Apart from the direct financial costs involved in the recruitment of expatriate personnel and its negative effects on the policy of 'localisation' (Section 4.2.1.5), the Surveys conducted revealed that the absence of easy access to the technologies for which engineers are trained retarded the implementation of development programmes -

> The absence of appropriate numbers of engineers is a drag on the real effort to meet development needs - the cost is wait time for the Ministry of Works engineering services which increases the cost of implementation in addition to diminishing efficiency ... The lack of qualified engineers is partially responsible for increases in development costs, poor design, unsatisfactory structural standards, premature write-off of equipment due to inadequate maintenance and the inability to make repairs in usual circumstances, all of which add considerably to the total cost of development output. (AAA Report;21-22;1980).

The importance of engineering skills and technological know-how in development activities is further reflected in the nine major ongoing development projects listed below, all of which incur considerable expenditure for the Government, and constitute an important role in the overall development process:

a) Lilongwe Land Development Programme Phase III
   Total cost US $13 million.

b) Shire Valley Agricultural Development Project Phase II
   Total cost $13.2 million.

c) Karonga-Chitipa Rural Development Project, Phase II
   Total cost $13.3 million.

d) Smallholder Tea Development
   Total cost $1.9 million

e) Crop Storage
   Total cost $533 thousand

f) Seed Technology
Total cost $403 thousand

g) Housing for agricultural extension staff
Total cost $1.8 million

h) Animal Husbandry
Total cost $1.3 million

i) Development of Dry Land and Irrigated Settlement Schemes
Total cost $1.7 million

j) Fisheries Development
Total cost $1.3 million

k) Development of traditional housing areas Parts I and II
Total cost $16.0 million

l) Transportation, major roads; Blantyre-Chikwana Road, $7.5 million
Karonga-Kacheche Road $924 thousand; Kasungu-Jendi Road $10.9 million.

m) Transportation, district roads
$12.4 million

n) Rural Water and Sanitation
Total cost $35.8 million.

(Source: AAA Report op cit.).

Hence, it may be concluded that expanded numbers of Malawian trained engineers will yield considerable benefits for the economy; the expenses incurred through the reliance on expatriate labour and external training of Malawian students will be reduced; positive effects will be reflected in the agricultural and rural sectors through improved infrastructure; while expansion of the private sector is likely to occur, since many projects are currently being postponed due to the non-availability of suitably skilled manpower.

6.5 A REVIEW OF THE DEMAND AND SUPPLY SITUATION FOR ENGINEERING PERSONNEL

As is reflected in Table 6.5 there are considerable numbers of vacancies existing in government, parastatal and private organisations for engineering personnel. The demand for such skills far outweighs the existing supply of trained manpower, and to date Malawi has met such demands only partially, and at considerable financial loss. The 'demand' has been met in a number of ways:-

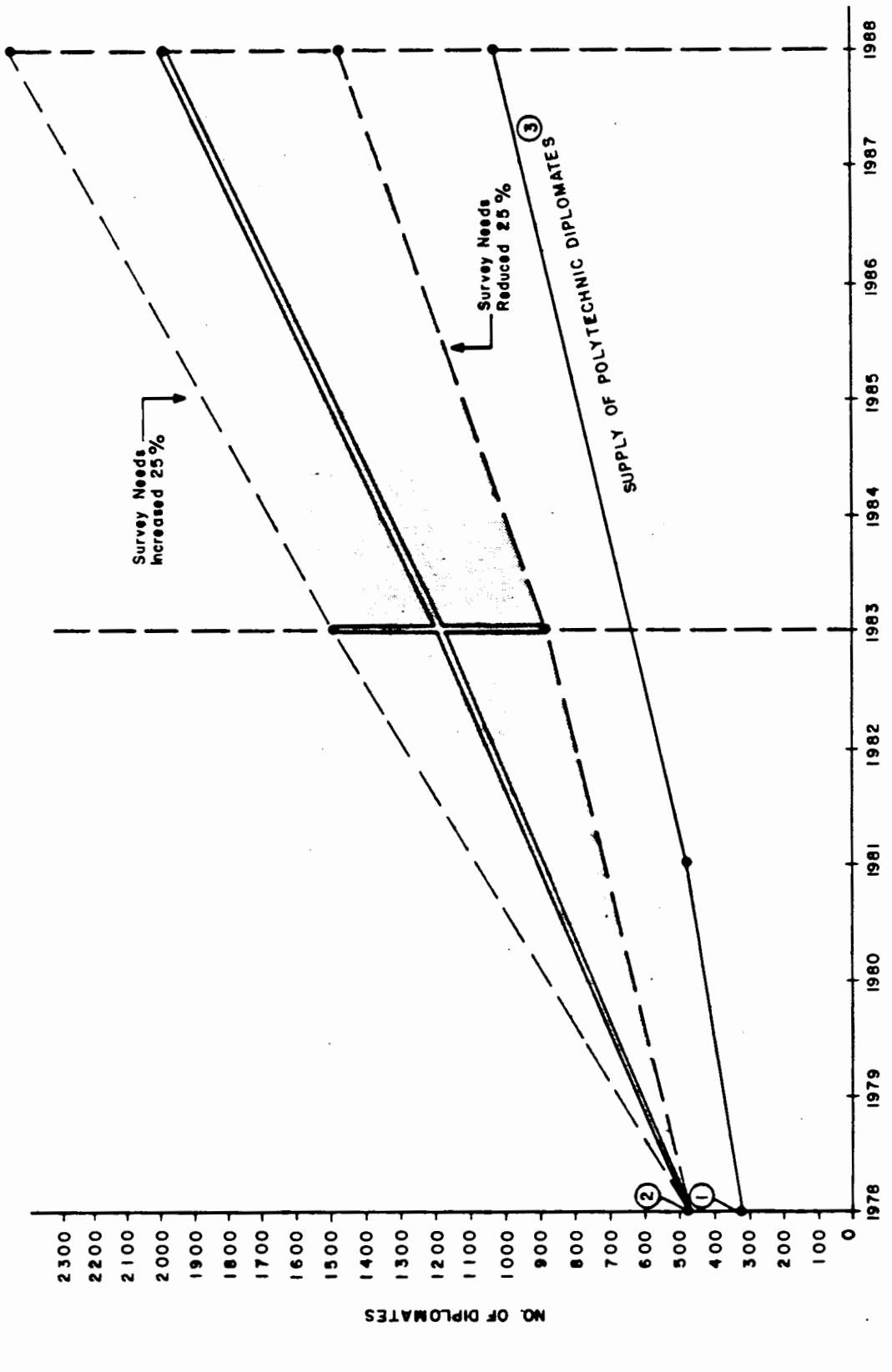


FIG. 6.1: Demand versus supply - Malawian Polytechnic Diplomates (Source: AID/AFR-c-1132; 1-2; 1979)

Note: Shaded area represents possible survey error of ± 25%.
Demand assumes no expatriates replaced therefore the demand estimate is very conservative.

(1) Existing supply of Malawian diplomates as of December 1978.

(2) Existing demand of Malawian diplomates as of December 1978.

(3) Supply of Malawian diplomates as result of projected expansion of Polytechnic.

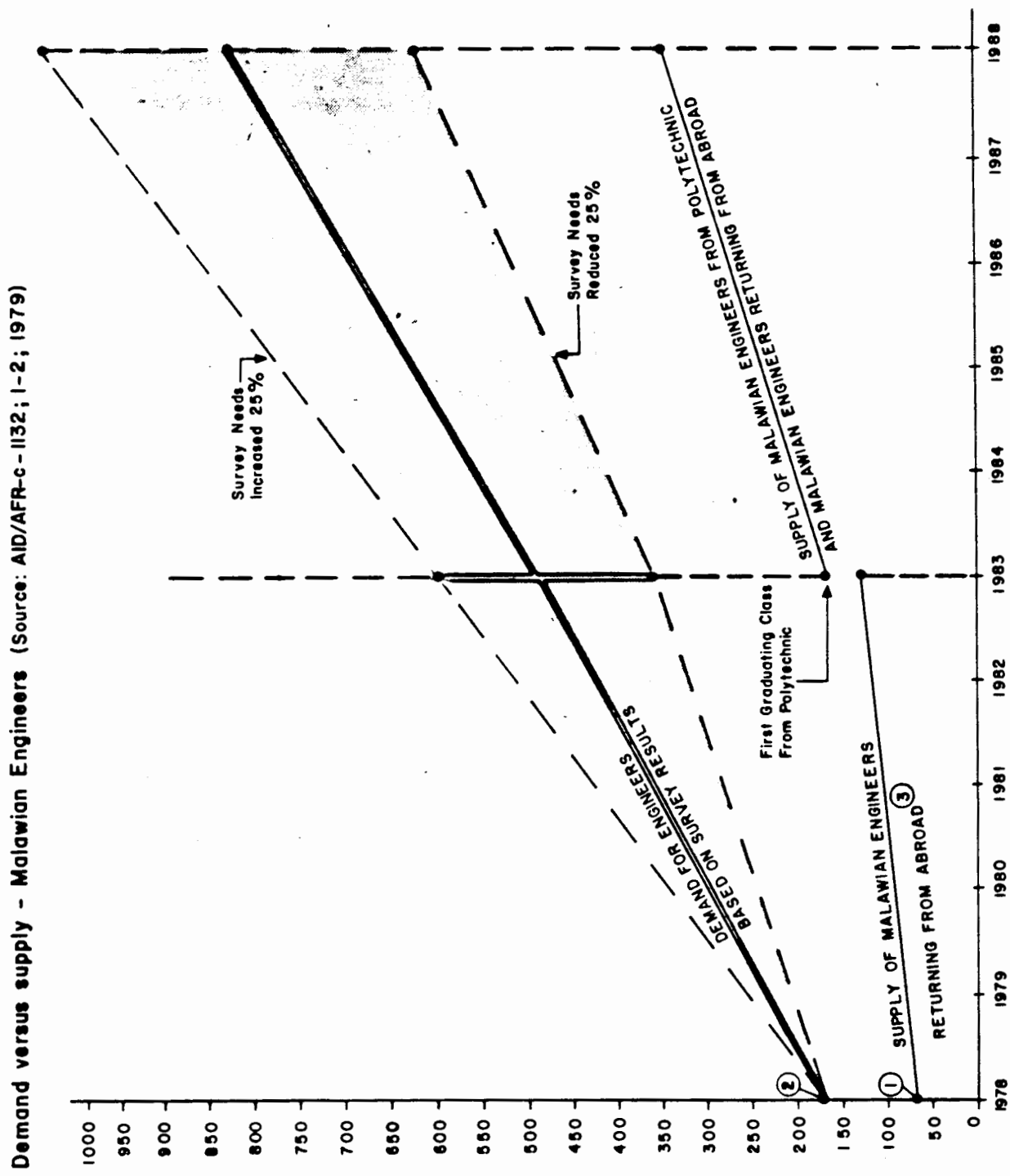


FIG. 6.2: Demand versus supply - Malawian Engineers (Source: AID/AFR-c-1132; 1-2; 1979)

Note: Shaded area represents possible survey error of ± 25%.
Demand assumes no expatriates replaced therefore the demand estimate is very conservative.

i) Increasing numbers of Malawian students have been sent abroad for training (Table 6.6)

ii) Through increased use of expatriate talent, with its high costs and other disadvantages

iii) Through cutting back on projects in lower priority sectors

iv) By attempting to do more labour substitution by breaking down skill-type technical jobs into smaller parts (Section 5.7.1) that can be handled by a larger number of less skilled artisans. Such measures do however, have little practical import for highly skilled engineering placements.

(U.S. AID Report, AID/AFR-C-1132;22;1979).

The existing demand for engineering manpower is greatest in government and parastatal organisations in line with the need to construct basic infrastructure and focuses on skills at three main category levels - professional engineering level, diplomate and technician level. Demand for these various skill levels is reflected in Figures 6.1 and 6.2 and warrants further examination if suitable educational and training opportunities are to be provided in Malawi in the future.

6.5.1 Professional Engineering Skills - Present Need and Future Demand

Table 6.2 reflects the engineering manpower requirements in 1978 and projected needs to 1983 when the Malawi Polytechnic should produce its first engineering graduates, and projected needs to 1988. The Table reflects projected needs for both Malawi and expatriate personnel since it is evident that local educational opportunities and out-of-country training will be unable to provide sufficient numbers of Malawian engineers. In 1978 the total number of professional engineers required totalled 124, a figure which represented at least four years of graduate output from the Polytechnic, and was likely to result in a number of vacant posts despite the continued heavy reliance on expatriate personnel.

TABLE 6.2

SUMMARY OF SURVEY RESULTS - ENGINEERS

PRESENT SITUATION DECEMBER 1978							PROJECTED SITUATION 1983			PROJECTED SITUATION 1988		
1 SECTOR	2 NOW IN TRAINING OUTSIDE MALAWI	3 EXISTING SUPPLY		4 PRESENT VACANCIES		5 TOTAL DEMAND AT PRESENT[c]	6 ADDITIONAL DEMAND[b]		7 ADDITIONAL DEMAND[c]	8 ADDITIONAL DEMAND[b]		9 ADDITIONAL DEMAND[c]
		MAL.	EXPAT.	MAL.	EXPAT.		MAL.	EXPAT.		MAL.	EXPAT.	
ENGINEERS												
PRIVATE INDUSTRY[a]	0	12	104	8	8	16	68	64	132	120	60	180
PARASTATAL AND CITY GOVERNMENT	59	29	22	32	10	42	83	3	86	96	0	96
NATIONAL GOVERNMENT	9	28	53	54	9	63	156	4	160	132	0	132
TOTALS FOR MALAWI	68	69	180	97	27	124	307	71	378	348	60	408

[a]Industry numbers have been adjusted based on ratio of sample size to total

[b]Additional or incremental demand over preceding period

[c]Malawians plus expatriates

(Source: AFR-1132-C;iv-9;1979)

According to the estimations of the AID Team, (iv-4;1979) the demand for professional engineers in 1983, in line with the implementation of development objectives, would amount to approximately 378 Malawians and expatriates. It was evident that the majority of these engineers (approximately 160) would be absorbed by the National government, with private industry absorbing approximately 132, and parastatal organisations, 86. (AID op cit.). However, it is possible that such calculations reflect a very conservative estimate, particularly with regard to the demands in the parastatal organisations which are likely to require increasing numbers of highly skilled engineers to implement projects such as the US $½ billion Vipya Pulp and Paper operation and the planned National Irrigation Scheme. Moreover, a number of private organisations are reporting (AID Report AID/AFR-C.1132;iv-5;1979) that if local engineering talent was available, their operations would be expanded considerably. Hence, the projected demand for skilled engineers as reflected in Table 6.2.1 below, should be treated as a conservative estimation of needs:

Table 6.2.1 Professional Engineering Skills - Present Needs and Future Demand

	1978 Need	Cumulative Needs by 1983	Cumulative Needs by 1988
Malawians	97	404	752
Expatriates	27	98	158
Total Cumulative Needs	124	502	910

NB These numbers are approximate and discount "localization" (Source: AID/AFR iv-6; 1979).

6.5.2 Diplomate Engineering Skills - Present Need and Future Demand

The demand for diplomate skills as reflected in Table 6.3 shows a pattern fairly similar to that of Table 6.2, i.e. that the rising demand was in similar proportions to the increased demand for professional engineering talent.

TABLE 6.3

SUMMARY OF SURVEY RESULTS - DIPLOMATES (OR EQUIVALENT)

PRESENT SITUATION DECEMBER 1978							PROJECTED SITUATION 1983			PROJECTED SITUATION 1988		
1 SECTOR	2 NOW IN TRAINING OUTSIDE MALAWI	3 EXISTING SUPPLY		4 PRESENT VACANCIES		5 TOTAL DEMAND AT PRESENT[c]	6 ADDITIONAL DEMAND[b]		7 ADDITIONAL DEMAND[c]	8 ADDITIONAL DEMAND[b]		9 ADDITIONAL DEMAND[c]
		MAL.	EXPAT.	MAL.	EXPAT.		MAL.	EXPAT.		MAL.	EXPAT.	
DIPLOMATES												
PRIVATE INDUSTRY[a]	4	172	128	64	12	76	260	104	364	312	84	396
PARASTATAL AND CITY GOVERNMENT	14	44	22	41	14	55	112	10	122	154	0	154
NATIONAL GOVERNMENT	5	110	18	59	6	65	279	0	279	324	0	324
TOTALS FOR MALAWI	23	326	168	164	32	196	651	114	765	790	84	874

[a] Industry numbers have been adjusted based on ratio of sample size to total

[b] Additional or incremental demand over preceding period

[c] Malawians plus expatriates

(Source: AFR-1132-C;iv-11;1979)

There were however, a number of additional factors revealed in the various Surveys conducted, which had to be noted with regard to the demand and supply for diplomate engineers.

In the first instance, the Malawi Polytechnic had been providing training at this level to a limited number of students since 1976 although a reassessment of the course was necessitated by reports from users of such diplomates that stronger theoretical and practical training was necessary. It was concluded that improvements in course content could result in some substitution of skills between the diplomate and professional engineering levels.

Another significant factor regarding the demand and supply of diplomate engineers in Malawi, concerns the exceptionally high numbers of expatriates employed at this level. The Richards Report (1974) revealed that these personnel generally held highly specialised posts operating high technology equipment, and their posts could thus only be localised over a considerable period of time.

Surveys conducted by AID (AID/AFR i.v-8;1979) however, pointed to the fact that moves towards localisation of these posts were essentially slow for a number of reasons:

- The organisations cannot afford to send diplomates abroad for further training
- Organisations sending diplomates abroad for such training run a great risk of losing their personnel to another organisation
- In view of the low standard of practical education received at the Malawi Polytechnic, it was argued that it would take the Malawi diplomate too long to acquire the skills needed to allow him to do the same job as the expatriate.

In order to ease the increasing cululative demand for diplomate engineering manpower as reflected in Table 6.3.1 below, the AAA Survey has given some consideration to the possibility of substitution of skills - "A choice exists between lowering some operating standards (when safety or equipment performance is not affected) by using more Malawians and continuing to maintain higher standards by using expatriates until localisation is feasible." (8;1980). However, to date little active substitution has occurred.

Table 6.3.1 : Diplomate Engineering Skills - Present Need and Future Demand

	1978 Need	Cumulative Needs by 1983	Cumulative Needs by 1988
Malawians	164	815	1605
Expatriates	32	146	230
Total Cumulative Need	196	961	1835

NB These numbers are approximate and discount localization

(Source: AID/AFR iv-6;1979)

6.5.3 Technician Engineer Skills - Present Need and Future Demand

The demand for Engineering Technicians reflects much the same pattern as the demand for professional engineers and diplomates, except far more acutely, particularly with regard to the projected demands for 1988. It is possible that there is a direct relationship between shortages in Technician supply and the shortage of secondary school placements (Section 4.5.2) as the Technician labour force has generally been recruited from secondary school graduates.

The ratio of Malawian to expatriate technicians is however, more favourable than in the case of engineers or diplomates as reflected in the cumulative demands for Technicians to 1988.

Table 6.4.1: Technician Engineer Skills - Present Need and Future Demand

	1978 Need	Cumulative Needs by 1983	Cumulative Needs by 1988
Malawians	344	1743	3599
Expatriates	46	148	250
Total Cumulative Demand	390	1891	3849

(Source: AID/AFR iv-8;1979)

TABLE 6.4

SUMMARY OF SURVEY RESULTS - TECHNICIANS

PRESENT SITUATION DECEMBER 1978							PROJECTED SITUATION 1983			PROJECTED SITUATION 1988		
1 SECTOR	2 NOW IN TRAINING OUTSIDE MALAWI	3 EXISTING SUPPLY		4 PRESENT VACANCIES		5 TOTAL DEMAND AT PRESENT[c]	6 ADDITIONAL DEMAND[b]		7 ADDITIONAL DEMAND[c]	8 ADDITIONAL DEMAND[b]		9 ADDITIONAL DEMAND[c]
		MAL.	EXPAT.	MAL.	EXPAT.		MAL.	EXPAT.		MAL.	EXPAT.	
TECHNICIANS												
PRIVATE INDUSTRY[a]	0	324	60	112	12	124	660	60	720	948	72	950
PARASTATAL AND CITY GOVERNMENT	40	258	58	122	34	156	271	40	311	432	30	462
NATIONAL GOVERNMENT	0	322	72	110	0	110	468	2	470	381	0	381
TOTALS FOR MALAWI	40	904	190	344	46	390	1,399	102	1,501	1,856	102	1,958

[a] Industry numbers have been adjusted based on ratio of sample size to total

[b] Additional or incremental demand over preceding period

[c] Malawians plus expatriates

(Source: US AID/AFR-1132-C-iv-13;1979)

The significant factor regarding the existing technicians, concerns the great job movement pattern evidenced. This has been attributed to the spiralling demand and increased benefits and salaries provided by the private sector in competition with the government organisations. Reports (AAA;1980;AID/AFR 1979) estimate losses from the Government Ministries to private organisations as being in the region of 30% annually, although proposed revisions in the Wages and Salaries Policy may help to combat this situation.

6.5.4 Demand for Engineers by Category of Engineer

The engineering courses offered at the Malawi Polytechnic have, since the recommendations of the Richards Report (1974) been offered along the lines of a very general curricula with optional specialisation courses in civil, mechanical or electrical engineering being offered in the final two years of study. This policy approach was adopted on the grounds of expected comparable long-term needs for each of the major engineering fields.

The AID Report of 1979 however, revealed that the assumptions of the Richards Report were no longer valid and in an analysis of ten-year cumulative demand for Malawian and expatriate engineers by category (Table 6.6) there was clearly a substantially greater demand for civil engineers than the other categories. This need is directly related to the required developments in Malawi's basic infrastructure, and this trend will clearly change once these are established.

Consequently, any evaluation or restructuring of the educational system to meet projected demands of engineering manpower should take this variation in need into account.

6.6 FACTORS AFFECTING THE AVAILABILITY OF ENGINEERING MANPOWER IN MALAWI

As has been discussed in Section 6.2, there are a number of factors which affect the availability or supply of local Malawian engineers, and in addition the possibility of recruiting suitable students to undergo training at the local institutions.

TABLE 6.5: ENGINEERING MANPOWER VACANCIES - TOTALS

OCCUPATION	TOTAL	MALAWIANS	EUROPEANS	NON-CITIZEN AFRICANS	NON-CITIZEN ASIANS	VACANCIES
ISCO CATEGORY 3						
Civil Engineers	73	2	71	0	0	14
Electrical Engineers	13	0	13	0	0	1
Mechanical Engineers	41	2	42	0	0	4
Chemical Engineers	1	0	1	0	0	0
ISCO CATEGORY 4						
Civil Engineering Technicians	145	87	58	0	0	43
Electrical Engineering Technicians	153	64	88	0	1	3
Mechanical Engineering Technicians	219	58	149	0	12	121
Aero-Engineering Technicians	15	1	14	0	0	0
Chemical Engineering Technicians	12	6	2	0	4	2
Other Engineering Technicians	13	3	9	0	1	3
ISCO CATEGORY 5						
Civil Engineering Assistants	27	27	0	0	0	9

TABLE 6.5 ENGINEERING MANPOWER VACANCIES - PRIVATE SECTOR

OCCUPATION	TOTAL	MALAWIANS	EUROPEANS	NON-CITIZEN AFRICANS	NON-CITIZEN ASIANS	VACANCIES
ISCO CATEGORY 3						
Civil Engineers	34	0	34	0	0	6
Electrical Engineers	10	0	10	0	0	1
Mechanical Engineers	33	1	32	0	0	4
Chemical Engineers	1	0	1	0	0	0
ISCO CATEGORY 4						
Civil Engineering Technicians	44	21	23	0	0	5
Electrical Engineering Technicians	55	27	27	0	1	2
Mechanical Engineering Technicians	148	34	102	0	12	104
Aero-Engineering Technicians	15	1	14	0	0	0
Chemical Engineering Technicians	12	6	2	0	4	2
Other Engineering Technicians	4	3	0	0	1	0
ISCO CATEGORY 5						
Civil Engineering Assistants	7	7	0	0	0	0

TABLE 6.5 ENGINEERING MANPOWER VACANCIES - PUBLIC SECTOR

OCCUPATION	TOTAL	MALAWIANS	EUROPEANS	NON-CITIZEN AFRICANS	NON-CITIZEN ASIANS	VACANCIES
ISCO CATEGORY 3						
Civil Engineers	39	2	37	0	0	8
Electrical Engineers	3	0	3	0	0	0
Mechanical Engineers	11	2	9	0	0	0
ISCO CATEGORY 4						
Civil Engineering Technicians	101	66	35	0	0	38
Electrical Engineering Technicians	98	37	61	0	0	1
Mechanical Engineering Technicians	71	24	47	0	0	17
Other Engineering Technicians	9	0	9	0	0	3
ISCO CATEGORY 5						
Civil Engineering Assistants	20	20	0	0	0	9

(Source: Data Extracted from Manpower Survey 1971;66;1980)

TABLE 6.6

SUMMARY OF SURVEY RESULTS - GRADUATE ENGINEER DEMAND BY ENGINEER CATEGORY

CATEGORY OF ENGINEER	PRESENT SITUATION DECEMBER 1978					PROJECTED SITUATION 1983			PROJECTED SITUATION 1988			
	PRESENT SUPPLY		PRESENT VACANCIES			CUMULATIVE DEMAND 1983[2]			CUMULATIVE DEMAND 1983[3]			PERCENT DEMAND BY CATEGORY[4]
	MAL.	EXPAT.	MAL.	EXPAT.	TOTAL	MAL.	EXPAT.	CUM TOTAL	MAL.	EXPAT.	CUM. TOTAL	
CHEMICAL	4	0	2	0	2	9	11	20	17	11	28	4%
CIVIL	27	73	64	7	71	230	21	251	380	33	413	60%
ELECTRICAL/ ELECTRONIC	10	8	9	7	16	41	11	52	87	11	98	15%
MECHANICAL	13	11	15	4	19	47	8	55	87	11	98	15%
OTHER[1]	6	10	1	3	4	20	4	24	34	4	38	6%
TOTAL FOR MALAWI	60	102	91	21	112	347	55	402	605	70	675	100%

[1] "Other" consists of marine, aircraft engineers and teachers
[2] Vacancies plus 1983 incremental demand
[3] 1983 Cumulative Demand plus 1988 incremental
[4] Rounded off.

(Source: US AID/AFR-1132-C;29;1979)

6.6.1 Quality and Quantity of Secondary School Graduates

Table 4.9 shows the projected demand for inputs at the Malawi Polytechnic and the available secondary school output. It would appear from Table 4.9 that there will be a sufficiently large pool of secondary school graduates from which the Polytechnic can select its students, but this does assume that there will be a high pass rate at the Malawi Certificate of Education level.

It has been common practice in the past for the Polytechnic to accept students with slightly lower Malawi Certificate scores than desirable in order to fulfil its complement of engineering students, which has had a number of adverse effects. This practice has meant that the Polytechnic must include a considerable amount of remedial work in the courses given in the first year of study, particularly in the mathematics/science sphere. In spite of the attempts by the Polytechnic to counteract the poor quality of students from secondary schools, the "users" of the Polytechnic engineering diplomates and graduates continue to assert that the graduates lack sufficient depth in theory and practical experience.

A number of measures to improve the quality of the Polytechnic engineering diplomate graduates have been instigated; clearly considerable time will pass before the effects of such steps will be felt. It is hoped that the improved secondary school teaching output from Chancellor College (Sections 4.5.5.1 and 4.5.5.3) and the planned expansion of secondary day and boarding schools (Section 4.5.2) will increase the pass rate at the Malawi Certificate examination which currently fails one-third of all students examined. It is also hoped that the increased educational opportunities afforded to women will also yield some women entrants to the engineering field.

6.6.2 Quality and Quantity of "Out-of-Country" Trained Engineering Students

Due to the fact that the Malawian Polytechnic offered Engineering studies only to diplomate and technician level prior to 1980/81, Malawian students wishing to pursue studies in engineering to degree level were obliged to undertake their studies abroad, funded by the Government of Malawi or sponsored by a private organisation. The number of these

TABLE 6.7. NUMBER OF MALAWIANS STUDYING ABROAD BY FIELD OF STUDY, 1968 - 1978

Field of Study	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978
Accountancy	3	1	3	1	13	23	32	34	40	35	37
Law	10	8	6	2	1	6	3	3	5	6	10
General Arts Degree	12	10	9	4	15	14	13	9	10	5	12
Anthropology and Social Studies	12	11	4	3	20	7	3	7	8	17	6
Economics	20	13	11	4	14	15	15	17	19	12	14
Statistics	10	8	3	1	7	4	6	11	15	10	6
Science Degrees (B Sc and Post Graduates)	11	8	9	2	9	11	10	14	16	14	15
Nursing and Allied Subjects	70	71	48	11	45	32	25	25	28	23	-
Medicine, including Premedicine	58	53	47	6	58	51	52	46	53	49	71
Other Medical Subjects	11	12	19	3	32	16	20	20	29	17	13
Agriculture	22	17	14	8	22	21	36	43	63	30	31
Forestry	11	8	15	5	16	4	7	7	16	18	2
Fisheries	2	1	1	1	2	3	5	5	9	2	4
Geological Studies	8	7	12	1	12	5	4	2	8	3	3
Veterinary Studies	12	14	14	8	29	17	27	16	29	11	14
Civil Engineering	18	22	23	8	20	11	11	21	26	30	26
Electrical Engineering	17	20	18	2	19	19	26	28	33	37	25
Mechanical Engineering	4	4	5	-	12	15	21	28	31	39	28
Radio Engineering	2	1	1	-	1	1	1	1	1	-	-
Telecommunication Engineering	15	28	30	16	20	13	15	6	28	14	12
Civil Aviation	3	4	-	4	8	6	8	9	23	9	9
Broadcasting	12	6	-	6	3	3	1	1	6	2	-
Education	49	41	43	44	37	36	29	30	60	4	34
Public Administration	13	8	7	14	13	3	2	6	26	7	15
General Certificate of Education(1)	15	15	15	-	25	38	39	41	43	42	39
Architecture	3	6	8	1	10	5	8	8	8	7	7
Navigation	-	-	-	-	-	-	-	-	3	3	3
Librarianship	-	-	-	-	-	-	-	-	5	4	7
Printing	-	-	-	-	-	-	-	-	6	5	4
Police	-	-	-	-	-	-	-	-	6	9	-
Post Office	-	-	-	-	-	-	-	-	12	9	12
Land and Quantity Surveying	-	-	-	-	-	-	-	-	13	1	7
Town and Physical Planning	-	-	-	-	-	-	-	-	6	8	-
Marine Engineering	-	-	-	-	-	-	-	-	6	4	8
Motor Mechanics	-	-	-	-	-	-	-	-	4	5	4
Chemical Engineering	-	-	-	-	-	-	-	-	5	5	4
Meteorology	-	-	-	-	-	-	-	-	10	5	4
Business Administration	-	-	-	-	-	-	-	-	11	9	14
Theological and Leadership Studies	-	-	-	-	-	-	-	-	25	15	18
Other	83	74	65	64	143	89	81	98	95	52	70
TOTAL	506	471	430	219	606	468	500	536	840	577	587

(1) Including Advanced and "O" Levels

SOURCE: Personnel Division (Training Office), Office of the President and Cabinet

students studying abroad was estimated in Table 6.7 . Due to the necessity of this out-of-country training, a professional engineer represented considerable investment of resources on the part of the country, and it was important to assess the "returns" to such investment, and whether in fact, the training received abroad was appropriate to Malawi's circumstances. The AID Team reporting on the shortage of trained engineers in Malawi thus gave these issues considerable attention and found considerable differences of opinion among users and sponsors of such manpower as to the benefits of such training:

- Private companies in general tend to rely on expatriate personnel but provide on-the-job training for an eventual Malawian counterpart. Many companies train their good local hires (i.e. diplomates from the Polytechnic) and give them an increasing amount of responsibility over time.
- Many companies, particularly the smaller ones, favour some specialised training but are unable to afford it.
- Some private companies oppose out-of-country training as a matter of principle.
- The private construction industry presently does not send anyone abroad for training, because of the high cost involved and the great risk of losing the returning student to the competitor.
- Specialised training to operate or maintain complex equipment is given to secondary school graduates (and lower level staff in certain areas) in the processing industries. These industries have unique equipment and therefore do not worry about losing their returned "expert" to another company.

(AID Report AID/AFR-C-1132;iv-12;1979)

The AID Team concluded that Malawi, certainly for the following decade, would have to rely heavily upon out-of-country training for its engineering manpower and thus this type of training should be considered an important aspect of Malawi's integrated educational system. It was concluded moreover, that such students received training of a high quality which was reasonably well matched to Malawi's requirements.

6.6.3 The Reliance on Expatriate Engineering Manpower

It was evident from Table 6.5 and Tables 6.2, 6.3 and 6.4 that the severe shortage of engineering manpower which existed in 1978 was to become increasingly critical. Indeed, the shortages were to reach such proportions that even with the outputs from the engineering degree programme from 1983, there would have to be continued reliance on expatriate personnel despite the high costs involved. The Government thus determined, in view of the extent of the projected engineering manpower shortages, not to pursue a policy of "localisation" (Ref. 5.7.1.4) such that levels of efficiency would be affected.

The evidence collected however, (AID Report, 1979, AAA Report, 1980) points to the fact that local companies have made very little effort to train local counterparts to their expatriate staff. It was thus concluded that a strengthening of the Government's position regarding "localisation" would help to ensure that Malawians received training at some level and that Polytechnic diplomates and technicians received proper placement in the work environment.

6.6.4 "Brain Drain", "Attrition", and "Piracy" Factors Affecting Engineering Manpower

It is clear that factors such as "brain drain", "attrition" and "piracy" must be accounted for in any engineering manpower projections since substantial losses of trained personnel for any of these reasons reduces considerably the returns to investment in training.

The Action Memorandum Report (AAA;1980) revealed in this regard, that the loss of personnel due to the "brain drain" syndrome, a common feature of many of the African LDCs (Nigeria and Ghana) is almost negligible. The vast majority of Malawian students in training abroad returned to Malawi on completion of their studies, and over a period of ten years, only two cases have been reported when the student failed to return. The government maintains a close control over this factor, not permitting students to leave the country without special governmental permission.

"Attrition" or wastage factors have similarly to be taken into account in any educational planning framework. Trained personnel who change to other professions or retire from their specialisation obviously leave

vacancies which must be filled. Once again, however, it is reported (AID Report iv-13;1979) that attrition factors will have an exceptionally limited influence on the projection of levels of manpower requirements. This is primarily due to the fact that the age of the engineering diplomates and technicians is heavily skewed to the lower age brackets. Indeed, it is reported (AID op cit) that few will even approach the government retirement age of fifty this century.

The supply and demand situation with engineers is so acute however, that the situation has given rise to spiralling wages and increased benefits, particularly in the private sector, which is less subject to the constraints of the Wage and Salaries Policy. Consequently a high degree of "piracy" of engineering diplomates and technicians occurs between private companies, government ministries and parastatal organisations, with some government ministries reporting up to a 30% loss in personnel to the private sector. (Section 6.5.3). This is clearly a situation which will continue until a balance is achieved betwen supply and demand.

6.7 THE APPLICATION OF BENEFIT COST ANALYSIS IN THE PLANNED EXPANSION OF TRAINED ENGINEERING MANPOWER IN MALAWI

The methodology of the Benefit Cost analysis procedure is best illustrated in Figure 6.3. From the Figure it can be seen that the method follows a number of predefined sequences:

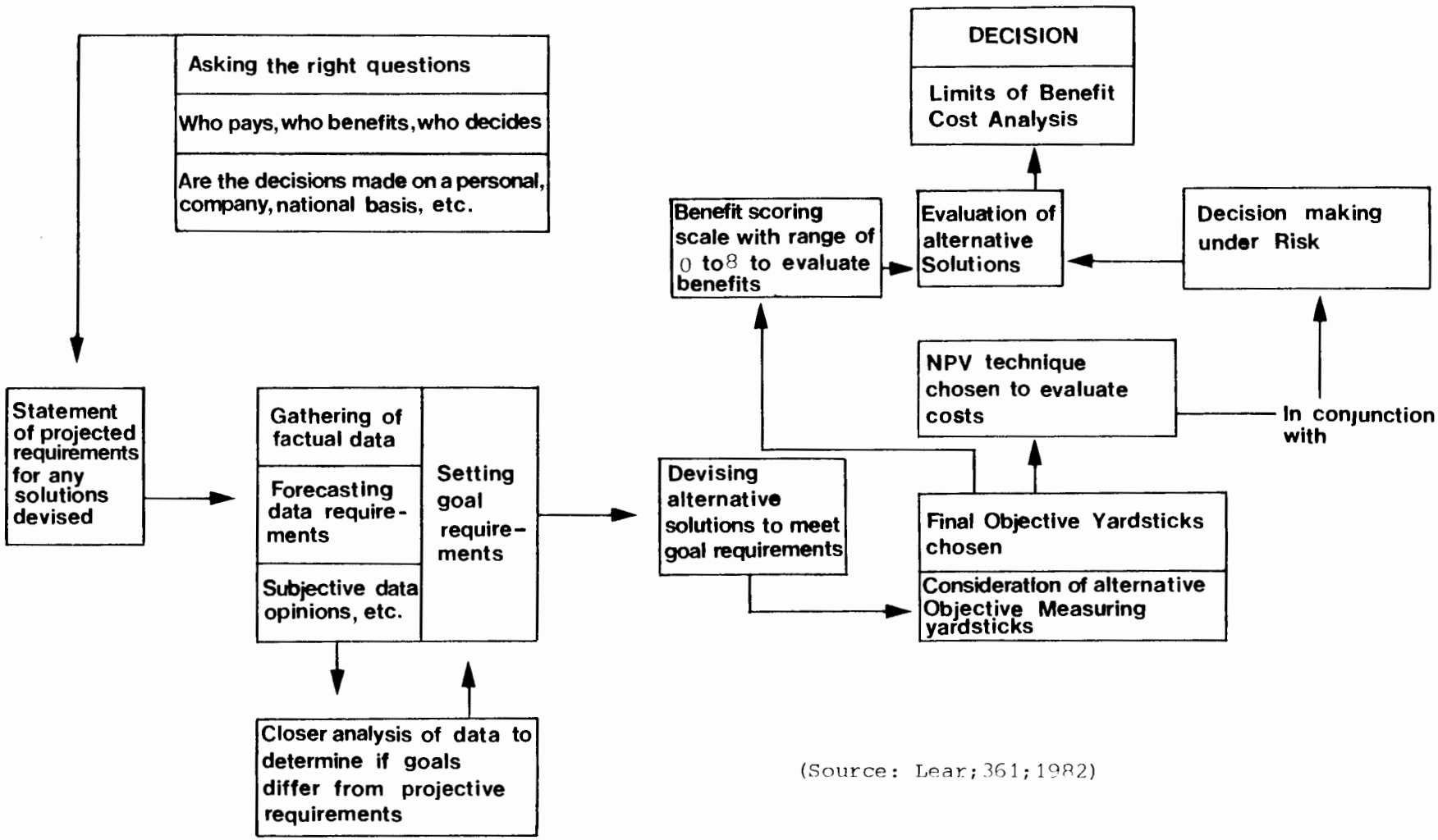
6.7.1 Data Inputs and Data Reliability

The collection of factual information and its reduction to quantitative or statistical data is the important step in this phase.

The data utilized in this particular study was obtained from interviews carried out by the Manpower Survey Team which gatered data for the AID Report of 1979. The Team collected data from 23 major private companies and from parastatal and government organisations which used engineering and technician talent. This data is effectively summarised in Tables 6.2, 6.3, 6.4 and 6.5.

The data gathered on usage and supply or demand characteristics of engineering personnel in private companies was based on surveys and interviews covering an estimated 25% of the total engineers in this sector. The reliability of the data is likely to have been affected somewhat by

Figure 6.3 ANALYTICAL PATHS OF A BENEFIT COST ANALYSIS



(Source: Lear;361;1982)

the Team's inability to carry out the survey in several subsectors of industry which were possibly heavy users of engineering personnel, notably the oil processing industries, the engineering consulting firms, the printing operations and sugar processing organisations. The opinion was also expressed by managers in the private sector, that projected requirements of engineering manpower usage beyond a five-year period were likely to be unrealistic and not sufficiently accurate as a basis for the formulation of sound planning decisions. (AID iv-8; 1979). Such opinions would seem to be supported by the findings of the U.S. Department of Commerce in 1974, that surveys of manpower needs in general, for periods beyond five years, and specifically beyond a ten-year period, reveal errors of as much as 100%. ('An Evaluation of the Occupational Training Information System". (OTIS) 1974). Consequently, these factors must be borne in mind when assessing the reliability of any planning projections.

However, data collection on the usage and demand for Engineering manpower in the parastatal and government organisations, is considerably more reliable since the Team reached an estimated 90% of the users of engineering manpower. Consideration of the data collected appeared though to yield a conservative bias. For instance, in some cases it was reported that "vacancies" were only seen to exist when Malawians were not availble to fill the post. The projected demand for engineering talents is also likely to be conservative in view of the fact that many major development projects are only to be initiated in the next decade and it is unlikely that such projections could adequately assess the full manpower requirements.

The Survey Team, in the final analysis concluded that the data collected was likely to show a conservative tendency as regards vacancies, for the following reasons:

i) The sample of government and parastatal organisations was not a total coverage of all agencies and organisations.

ii) The Industrial Training Act Levy (1978) - used to obtain the ratio of population of engineers or technicians in private companies to the observed sample - did not cover the companies' 100%. The Labour Department estimated the Levy as having a coverage of 50%, thus making the survey conservative.

iii) A more recent Levy (1979) showed at least a 10% increase over the one used by the Team. It could thus again be assumed that the results of the Team's Survey are on the conservative side.

6.7.2 The Formulation of Goal Requirements

The important role which education plays in the "accelerated development" process in the LDCs has been discussed at length in Chapter 3. It was determined that while the provision of educational opportunities yielded positive social returns to the nation and private returns to the individuals, the provison of such educational facilities necesaarily involved the investment of a substantial amount of scarce resources. Moreover, as education displays many of the characteristics of a "public good" it is typically provided, and heavily subsidized by the government. In the provision of such facilities it is necessary, as Cohn (9;1979) points out, for the government to allocate available public resources to those areas which are likely to yield the greatest returns to such investment. The determination as to which investments will yield the greatest returns will involve the government in the assessment of a number of factors:

- The identification and measurement of the economic value of education.
- The allocation of resources to education.
- Teachers' salaries and training.
- The financial investment in education, and educational planning.

The Government of Malawi has initiated such investigations regarding the returns to educational investment, and the planning of future investment in educational provision by way of a Manpower Planning Survey conducted in 1971 (Section 5.7.1). It was determined however, that this approach incorporated a number of serious limitations for a nation in Malawi's circumstances (Section 5.7.1.4), the main limitation being a lack of flexibility in the planning procedure, and the reliance on data in the planning framework which was of questionable validity.

Consequently, in the implementation of any new planning framework, one of the main objectives should be to allow for increased flexibility in the planning procedure. The Benefit Cost analysis procedure permits this increased flexibility (Section 6.3) while encouraging the formulation and establishment of a series of realistic goal requirements.

In the area currently under consideration, the major goal requirement may be seen to be the determination of the most economically efficient and effective way of relieving the current and projected shortage of professional engineering talents and diplomate and technician skills (as revealed in Table 6.5), which have been ascertained to be a considerable impediment to the pursual of developmental objectives in both the rural and urban sectors of the economy.

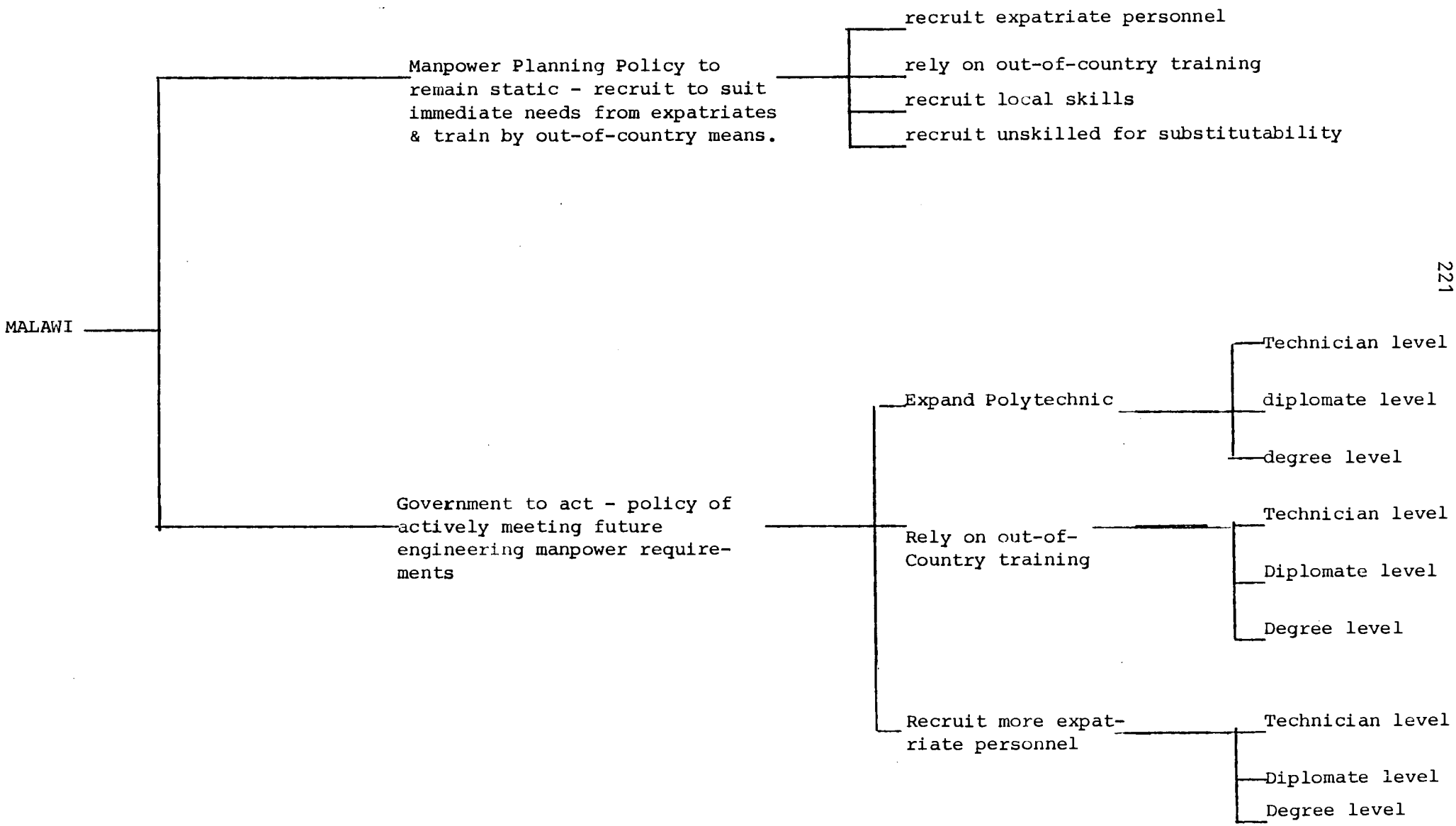
In most instances, it is accepted that objectives and goal requirements reflect the enumeration and quantitative estimation of the costs and benefits incurred through investment in the education of engineers or through the alternative means of obtaining this manpower. In the establishment of such goal requirements, it is also necessary to assess the opportunity cost or shadow price of not following one possible course of action or another. Hence, in the present instance, the planner would, for example assess the costs and benefits associated with the expansion of the Polytechnic and the increased output of engineering graduates, and the opportunity cost of not undertaking such expansion.

6.7.3 Generating Alternative Solutions

Having established the goal requirements, it is necessary in the Benefit Cost framework to identify alternative solutions to the problem at hand. Such solutions as are proposed, will then be evaluated against the set goals. The technique typically employed in the determination of the various alternative solutions is a decision tree analysis. The alternative solutions which may be pursued in an attempt to overcome the projected shortage of engineering manpower are presented in this decision tree diagram. (Figure 6.4).

The decision tree explores the routes available for obtaining a supply of professional engineers, diplomates and technicians each year and gain a total of 2644 engineers over the period 1978 to 1983. Although these figures are far short of the estimated requirements of needs by 1988 they are the most realistically optimistic estimations of future trained manpower output.

FIGURE 6.4 : GENERATING ALTERNATIVE SOLUTIONS TO THE PROBLEM OF MEETING DEMANDS FOR TRAINED & SKILLED ENGINEERING MANPOWER IN MALAWI.



The decision tree assesses only the major alternative courses of action available in the problem of overcoming the projected shortage in engineering skills, rather than the large number of combinations and permutations of solutions that are possible in such circumstances. The analysis of all such alternatives would prove a lengthy process and be of little value since Malawi is concerned only with the most feasible solutions available.

Figure 6.4 was derived from statistical data obtained from the results of the AID Report of 1979 (Section 6.7.1), the Action Memorandum Report (1980) and the findings and projections of the Manpower Survey of 1971. The Figure demonstrates the component parts into which the projected demand of professional engineers, diplomates and technicians may be divided to allow for a cost and benefit to be allocated to each route.

As is evident from Figure 6.4 there are three major alternative courses of action which may be pursued in an attempt to meet the engineering manpower requirements - (a) engineering diplomates and technicians may be trained at an expanded polytechnic facility; (b) there could be recourse to increased out-of-country training schemes, or (c) the shortage may be met by increased reliance on expatriate personnel. The costs associated with the training or recruitment of professional engineers, of diplomate engineers and of technicians will clearly vary in view of the differing lengths of training involved for each occupation, and this must be taken into account in the estimation of the costs and benefits associated with each course of action.

6.7.4.1 Measures of a Projects Profitability

In trying to assess whether or not a project or alternative is a "worthwhile" course of action to pursue, it is accepted that any alternative will yield a number of costs and benefits which will be spread over a number of years. It is therefore necessary that the costs and benefits associated with each alternative be summarised to give a single measure of a projects value - "The basic technique is to discount costs and benefits occurring in different periods and express them all in a common value at any one point in time." (Square and Van der Tak;39;1981).

Hence, the evaluation of the costs and benefits of a possible alternative may be assessed either in terms of its maximization of returns on a fixed

investment, or alternatively according to its potential for minimizing investment for a fixed return. (Faull; cited in Lear 83;1982).

As was discussed in Section 6.2 however, projects are frequently implemented by governments which involve the provision of social or public goods, the outcomes of which are not always easily reduced to quantitative or numerical data. Hence, the costs and benefits of such courses of action are convertible to interval or ratio data measurements. The benefit cost framework however, necessitates the quantification of the outcomes in some manner if any comparison of the investments and returns to alternative solutions is to be carried out.

The calculation of the private rates of return to educational investment in purely quantitative or financial terms is a relatively simple and widely accepted practice, having been effectively carried out in a wide range of studies, among them Hansen's (1963) calculation of the lifetime returns to investments in education in the United States, and Thias and Carnoy's (1972) study of Kenya.

The calculation of the social benefits derived from investment in education, which this study is particularly concerned with, is however, a considerably more complex issue than the evaluation of private benefits. The assessment of social benefits on the same lines as private benefits is not a feasible exercise, as Cohn (48;1979) points out -

> Lifetime income differentials may be used as an index of the social benefits of education on the presumption that higher earnings represent greater productivity. Such a presumption is based upon the neo-classical theory of income distribution - namely that each productive factor is paid a wage equal to the value of its marginal contribution to output .... Some writers question the validity of the assumption that education is responsible for increased productivity of individuals. Moreover, others question the validity of the neo-classical theory of income distribution, arguing that bureaucratic wage scales are frequently totally unrelated to one's productivity. Such an assertion is clearly more relevant in countries where the private sector is relatively weak.

More typically however, because of the "social good" characteristics linked to educational provision, it is in many instances virtually impossible to measure the monetary benefits associated with a given programme. As Blaug (121;1976) states, "the prices generated by the

market mechanism will rarely serve as suitable weights for appraising the output of the public sector, for the simple reason that government activity in the field usually arose, in part at least, as a response to market failure." In such cases, where precise monetary values cannot realistically be attached to the costs and benefits linked to the various alternative courses of action, it is still frequently possible to construct some measure of "effectiveness". Hence, it is proposed that the adoption of a cost-effectiveness analysis (Section 6.2) in such instances will assist in the evaluation of project proposals.

> For all practical purposes, the distinction between Benefit Cost and Cost Effectiveness analysis is that the former is concerned only with economic benefits, whereas the latter takes account of all objectives, whether economic or not. This means that in Benefit Cost analysis we usually end up with a single decisive Benefit Cost ratio or an equivalent thereof, such as an internal Rate of Return.
> Cost Effectiveness analysis however, may yield a number of criteria on different definitions of objectives, and in general, as many criteria as there are differing objectives. ... in the final analysis all educational projects must be submitted both to Benefit Cost analysis and to a variety of Cost Effectiveness analysis, one for each separate quantifiable non-economic goal of education. (Blaug;122-123;1976).

Cost Effectiveness analysis has been applied to educational planning in a number of studies (Levin;1970; Wolfe;1977) and by Webster (1976) in formulating decisions as to whether a school system should expand, retain or eliminate certain programmes.

In the present study, it is evident that the major feasible alternatives and the problem under study itself, do not permit of easy quantification of all variables. The costs are relatively easily determined in terms of financial expenditure. The benefits or returns to these investments are not easily enumerated and quantified. Indeed, the application of Cost Effective techniques would appear to be most appropriate, and to such ends, a system of ranking the benefits derived has been formulated.

Roscoe (7;1969) thus proposes that the "quantification of such variables be undertaken by ranking or assigning values to the costs and benefits of the alternative solutions along a nominal or ordinal scale. An example of the type of scale utilized in such ranking methods, is illustrated by Lear (82;1982):

8 - of great benefit/extremely costly
6 - very beneficial/very costly
4 - beneficial/of medium cost
2 - of little benefit/below average cost
0 - of no benefit/no cost

The procedure whereby benefits arising from investment in the alternative solutions were determined and scored is discussed in further detail in Appendix E.

In the application of the Benefit Cost and Cost Effectiveness technique to the evaluation of alternative means by which projected shortages of engineering manpower could be overcome, both rating methods were utilized; nominal/ordinal scales in cases where factors were not quantifiable, and ratio/interval scales where data could be reduced to monetary investments and returns. However, in assessing the investment and return features associated with the alternative solutions, it is essential that some common criterion be used to assess and compare the differing investments. (Square and Van derTak;1981). Thus, a 'decision yardstick' has to be chosen to evaluate alternatives as well as a method of determining inconsistencies in the data which may lead to substantial changes in the result of applying the decision yardstick. Consequently, the quantifiable costs and benefits that are obtained may be evaluated through the application of a decision criterion and the level of 'risk' associated with each alternative assessed through the determination of the probabilities of occurrence.

6.7.4.1.1 Net Present Value

In the assessment of any alternative, there will be a number of costs and benefits (alternatively seen as expenditures and receipts) associated with the implementation of the project. If the overall, long-term effect of the project is to be appreciated, it is necessary that the overall effects of the costs and benefits be assessed. Hence the costs/expenditures may be viewed as negative and the benefits/receipts as positive. If this procedure is carried out for all the costs and benefits incurred in a single year, without discounting, the Net Cash Flow for that year is obtained. If a series of net cash flows are obtained for future years and discounted, the planner obtains the Net

Present Value (NPV) of the project (UEA;4;1982). This is represented in the formula below:

$$\sum_{t=o}^{n} bt/(1+i)^t \rightarrow \sum_{t=o}^{n} ct/(1+i)^t$$

where : bt = annual benefits
ct = annual costs
i = rate of discount
n = life span of the project (Cohn;97;1979)

It is possible also to include in the calculation the cost of capital necessary to implement the project, in which case the formula takes the following form:

$$NPV = \sum_{j=1}^{n} \frac{Bt - ct}{(1+k)^t}$$

where K = cost of capital (West & Brigham;294;1978)

In the implementation of this approach, the planner thus finds the present value of the expected net cash flows of an investment, discounts it at the cost of capital, and subtracts it from the initial cost outlay of the project.

The NPV rule, as Prest & Turvey (703;1965) point out, is thus to "select all projects where the present value of benefits exceeds the present value of costs", - in other words, if the discounted value of the benefits is less than the discounted value of the costs, the project should be rejected.

However, the NPV rule may not always be relied upon as such an accurate measure of project evaluation. As Squire & Van der Tak (39;1981) point out

> In practice, projects with a positive (or zero) NPV should not necessarily be accepted for two reasons. First, the shadow prices of some inputs, such as Land or site value or mineral resources, are virtually impossible to estimate independent of the project appraisal process itself. Consequently, the opportunity cost of such inputs may be seriously underestimated because their best alternative use may not have been identified. In principle, the relevant alternative use should be determined by a careful analysis of all conceivable projects; in practice, however, only a few alternatives can be examined. Nevertheless, it should be borne in mind that a high NPV may reflect an inadequate search for alternative projects rather than a potentially valuable project.

Second,there are many projects that, by their nature, are mutually exclusive ... In all cases of mutually exclusive projects, it is not sufficient to choose a project with a positive NPV; rather the project with the highest NPV among the mutually exclusive alternatives should be selected.

6.7.4.1.1.1 Choice of a Discount Rate

In the computation of the NPV of an alternative solution, it is necessary that a discount rate or set of discount rates be specified - this is the rate/s of return given the financial conditions for obtaining cash and the investment opportunities likely to be open in future years. (Little & Mirrlees;12;1974). Hence, the discount rate should enable the planner to evaluate the present value of any future income or expenditure from courses of action instigated at the onset of the programme. This is represented in the formula:

$$1/(1+d)^t$$

where: 100d = the percentage rate of discount
t = the number of years ahead

The selection of an appropriate discount rate is important in that it permits the planner to evaluate at one period in time expenditures and receipts which occur at differing phases of the project implementation and project operation.

The choice of a suitable discount rate is open to considerable controversy. The discount rate has been calculated on "safe" bonds for use in public projects, and also on the basis of the marginal internal rate of return on the next best alternative investment. (Cohn;101;1979). The most common approach however, is the application of a sensitivity analysis to each decision-making process. Thus, rather than compute the NPV of a project for only one discount rate, the planner subjects each project to computation for a number of discount rates, thereby enabling projects to be ranked according to their present worth for each of the chosen discount rates. (Square & Van der Tak;1981).

The choice of an appropriate discount rate in the calculation of NPV as applied to educational planning poses particular problems however. As was pointed out in Section 5.6, the calculation of the returns to

educational investment is difficult due to the long gestation period. The fact that education may yield returns on investment for periods up to 30 years or more, is of particular significance in the consideration of the discount rate on productivity.

> ... Since the useful life for competing investments tends frequently to be shorter, the relative case for investment in education is low if the appropriate rate of discount is high. Thus, the selection of the appropriate rate of discount is of particular importance in assessing the share for education in total capital formation. There being no developed capital markets which provide a clear indicator of this rate, its determination becomes essentially a matter of public policy. Investments should be ranked by a present value rather than an internal rate of return criterion. (Meier;525;1976).

The appropriate rate of discount in the present study on shortages of engineering manpower in Malawi was taken to be 15%.

6.7.4.1.1.2 NPV and Opportunity Cost Considerations

The selection of a relevant discount rate has been seen (6.7.4.1.1.1) to have important repercussions on the outcome of the NPV calculations and their reliability. If in the calculation of the NPV, the discounted value of the benefits is seen to be less than the discounted value of the costs, the project is ideally considered not feasible for implementation. Projects which yield a positive or zero NPV are taken to represent feasible alternatives. Little & Mirrlees (1974) point out though, that such positive returns should not be taken to indicate the unquestioned implementation of the project.

It has been frequently experienced (Squire & Van der Tak;1981) that the shadow prices attached to some of the inputs to projects are almost impossible to estimate independently of the project situation which is under study. The net result is likely to be an underestimation of the opportunity costs of such inputs, since the alternative ways in which they could have been employed may not have been identified or measured. Thus a high NPV may in fact reflect an inadequate search for alternative projects rather than a potentially valuable project. It is thus necessary that the opportunity costs attached to the various alternative solutions be taken into account.

Figure 6.5 thus describes in general terms the costs to Malawi of obtaining or not obtaining (i.e. the opportunity costs) qualified engineering personnel.

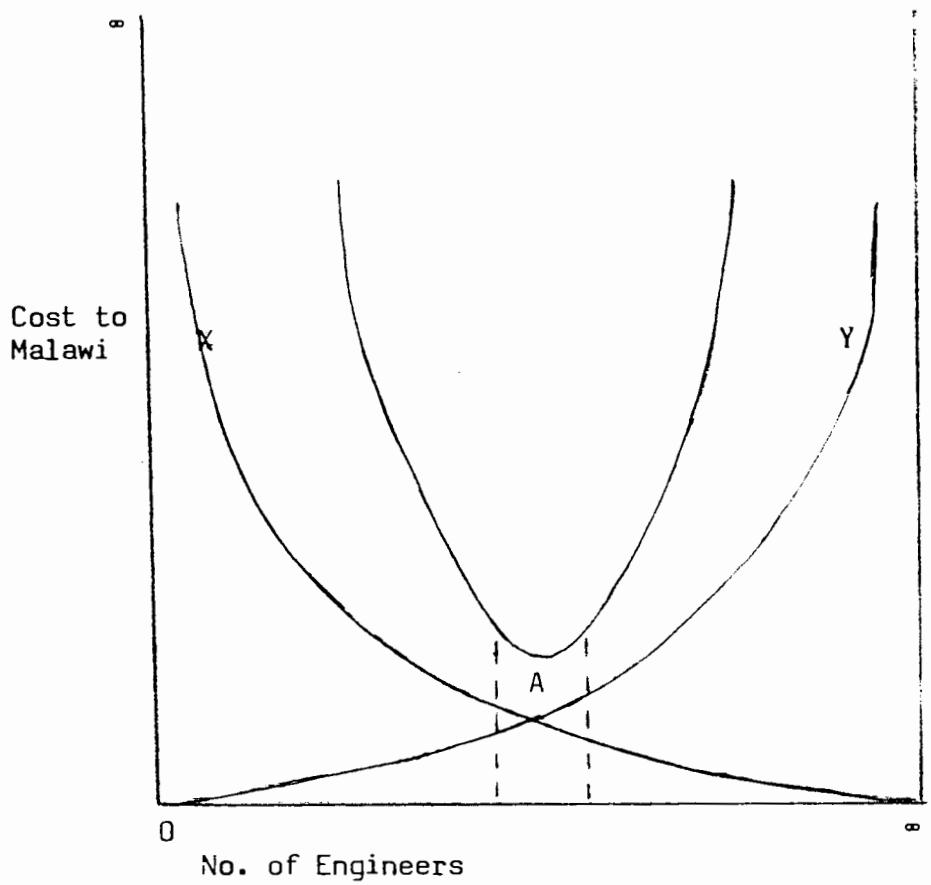


Figure 6.5 Theoretical Depiction of Costs/Opportunity Costs Associated with meeting Engineering Manpower Requirements.

Curve X of Figure 6.5 describes the decreasing cost of not employing engineers (the opportunity costs). If the nation has severe engineering manpower shortages, costs are extremely high in terms of lost opportunities in the implementation of development objectives and projects. This cost decreases to a point where the nation avails itself of every opportunity to obtain engineering manpower to implement its development objectives.

Consequently, it is essential that the opportunity costs associated with the various project alternatives is assessed. This is typically done by means of shadow pricing techniques.

6.7.4.1.2 The Internal Rate of Return

The Internal Rate of Return (IROR) has been the most commonly used "decision criterion" in the comparison of the costs and benefits of various types of investment in education, being used in studies by Hansen (1963) Mincer (1974) and Carnoy & Marenbach (1975). Blaug (54;1976) advocates the use of this discount criterion rather than the NPV -

> If the phrase "education is investment" is to be more than a metaphore, it ought to be possible to calculate rates of return on transforming present into future income via education investment. This is not a simple matter of looking up answers in compound interest or present value tables, because these are invariably calculated for uniform cash flows; but ... the net earnings streams associated with or attributable to education vary with age.

The calculation of the IROR is represented by the equation:

$$\frac{(Bt - Ct)}{(1+r)^t} = 0$$

Where: Bt = expected benefits t years hence
Ct = known costs of education
r = required rate of return

(Blaug 56;1976)

In applying this formula, it will be found that for the majority of projects the net present value is positive at low discount rates and declines as the discount rate is increased, eventually becoming negative. This is because the net cash flow is usually negative in the early years because of such things in educational projects as initial construction and implementation costs, while the benefits or returns to educational investment accrue in later years. At higher rates of discount, the benefits therefore receive a relatively smaller weight and are likely to be outweighed by the costs which are incurred earlier. The NPV is therefore likely to become negative. The internal Rate of Return is therefore the rate of discount at which the net present value is zero. (UEA;7;1982). If this decision criterion is

to be employed, it is essential that the planner be aware of the fact that not all projects will be negative at their onset and then become positive for the rest of their implementation. It is quite possible that there might be more than one change of sign in the net cash flows. Predetermined rates of discount, although exceptionally difficult to obtain, then assist greatly in the computation of the IROR.

6.7.4.1.3 The Cost-Benefit Ratio

The cost-benefit ratio may be obtained, for any discount rate, by dividing the present value of the benefits by the present value of the costs.

The technique clearly encompasses a number of drawbacks; it is really only applicable in instances where the alternative solutions are achieved in the short-term since the time value of money is not taken into account. (Lear;83;1982). Another disadvantage attached to its use is that the cost-benefit ratio calculated is likely to vary, depending upon whether some 'costs' are netted out of the benefits.- there is moreover, no guideline as to which costs should be or not. Hence, as Squire & Van der Tak (24;1981) point out, double counting is likely to occur if this decision criterion is employed, thus yielding unrealistic returns to investments in the theoretical analysis.

6.7.4.2 Decision Making Under Risk and Uncertainty

It must be taken into account in the implementation of any planning proposals that there is a possibility that the expected benefits will not accrue to the projects, or alternatively, that the benefits which do accrue will be markedly different from those planned. "Uncertainty is inherent in project analysis. Estimates of costs and demand, of shadow prices and the parameters underlying them, and of consumer surplus and externalities are approximate even for the present, and uncertainty increases when those estimates are projected into the future, as the analysis requires." (Squires & Van der Tak;44;1981).

Hence, it is important that the planner evaluate the possibility of such change occurrences and assess the "risk" involved and the implementation of the alternative solutions.

A number of means of incorporating "risk" in the evaluation of alternative solutions have been proposed. Cohn (102;1979) proposes the addition of a 'risk premium' to the discount in the present value formula, asserting that this would amount to "an increase in the discount rate commensurate with the degree of riskiness attached to each project", although Squire & Van der Tak (op cit) oppose such measures on the grounds that they are likely to distort the comparison of alternative projects. The same effect could, however, be obtained through the application of 'sensitivity analysis' - the magnitudes of the more important variables are manipulated by a certain percentage such that the planner might determine how sensitive the NPV is to the changes -

> sensitivity analysis helps to provide a better understanding of the critical elements on which the outcome of the project depends. It may focus attention on the variables for which a further effort should be made to firm up the estimates and narrow down the range of uncertainty. It may also aid the management of the project by indicating critical areas that require close supervision to ensure the expected favourable return to the economy. Squire and Van der Tak;op cit).

Eckstein (1961 cited in Cohn 1979) puts forward further possible ways whereby risk can be taken into account:

a) By contingency allowances, which arbitrarily raise certain categories of costs by a certain percentage or reduce benefits through price assumptions which are below expected prices.

b) The planner could put a limit to economic life shorter than physical life, but also shorter than expected economic life. Pure risk could be taken into account by incorporating the probability distribution of outcomes into the objective function, resulting in modified decision rules for investment.

6.7.5 Selection of Decision Criteria and Assessment of Risk in the Application of the Benefit Cost Framework to the Problem of Meeting Projected Engineering Manpower in Malawi

The most feasible courses of action available to the Government of Malawi in its attempts to meet the projected requirements of trained engineers, diplomate engineers and technicians, are outlined in Figure 6.4 and were mentioned in Section 6.7.3. It was seen that

three primary decision paths were available to the Government if action was to be undertaken to remedy the manpower shortage:

- Substantially expand and upgrade courses offered at technician, diplomate and degree level by the Polytechnic. This measure would necessitate the expansion of the facilities at the Polytechnic - increased class and library facilities, the recruitment of more teaching staff, etc.
- Increase the numbers of Malawian students receiving out-of-country training in engineering fields. This is a costly alternative having a high degree of risk attached through the possibility of brain drain.
- Recruit more expatriates at all engineering skill levels, an expensive alternative which is incompatible with the 'localisation' policies.

The selection of one of these three major alternative solutions necessitates consideration of further possible courses of action; a decision must be made by the planner as to the level of investment in each of the three kinds of engineering talents required in Malawi; professional engineering talents, diplomate level skills or technician skills. Clearly, decisions made in this regard will be largely determined by estimated demands of these skills, and also by the formulation of development policies and programmes.

The next stage in the decision tree is the determination as to whether plans should be made simply for the training of manpower in these skills, the assumption being that some percentage of those trained will return to work in Malawi, or alternatively choose to remain in Malawi and utilize their skills there, rather than immigrating to another country. A more appropriate course of action might be to plan to train the personnel and devise some fairly reliable means of retaining their services in the country.

Decisions concerning the training and retaining of engineering manpower in Malawi can be taken a stage further, in that a conscious decision could be made to train and retain manpower for public sector projects as opposed to attempting to simply retain the manpower in Malawi as

a whole as is currently the policy (Section 6.6.4). In view of the fact that the government ministries lose on average 30% of their trained engineering manpower to the private sector each year (Section 6.5.3) it would appear that this is an area worthy of consideration.

It is necessary, in the consideration and evaluation of these courses of action, that the 'risk' (as discussed in Section 6.7.4.2) associated with the alternatives is determined, if realistic guidelines are to be obtained through the Benefit Cost analysis.

6.7.6 Determination of the Costs and Benefits of Alternative Solutions

The decision tree (Figure 6.4) listed the major feasible alternative solutions open to the planner if attempts are to be made to meet the projected demands for engineering manpower in 1988.

In the determination of the costs and benefits associated with each course of action, the alternative solutions will be calculated in the order of decision paths noted in Figure 6.4, namely expansion of tertiary education facilities at the Polytechnic; increased government sponsorship of out-of-country training programmes; or increased realiance on the recruitment of expatriate personnel.

The detailed calculations and working of the costs and ranking of the benefits can be found in Appendices B, C and D. Full details as to how the costs of each alternative were assessed can be found in the Appendices. Details of the methodology used in devising the benefits and the scoring procedure for the benefits are expanded upon in Appendix E.

6.7.7. Evaluation of Alternative Solutions

The NPV, in view of the factors reviewed in Sections 6.7.4.1.1.1, 6.7.4.1.1 and Chapter 5 was selected as the most appropriate method for evaluating the costs of the alternative solutions featured in Figure 6.4.

The evaluation of the benefits to be derived from each alternative solution was determined through the use of a scale of eight to zero (Appendix E).

However, in conducting the calculation of costs and evaluation of benefits a number of assumptions were made.

6.7.7.1 Recruitment of Expatriate Manpower

It was assumed that the cost of recruiting expatriate engineering manpower at professional, diplomate and technician level was straightforward, requiring the assignment of costs such as airfares, housing, salaries, etc. in the recruitment procedure.

6.7.7.2 Out-of-Country Training

It was assumed that the cost of out-of-country training of engineering manpower is straightforward and requires the assignment of costs such as airfares, fees, etc. In view of the low levels of "brain drain" experienced from Malawi to date (Section 6.6.4) the risk probabilities of losing the trained manpower have been estimated to be low.

6.7.7.3 Cost of Capital

The cost of capital was assumed to be 15% for the purposes of solution and cost calculation.

6.7.7.4 Inflation

The inflation rate was taken to be 15% per annum.

6.7.7.5 The Benefit Scale

The benefit rankings associated with the alternative courses of action have none of the properties of interval or ratio meansurements - i.e. a benefit score of '8' is not twice as good as a benefit score of '4'. This should be taken into account when evaluating the rankings attached to each possible solution.

6.8.1 Limitations of the Benefit Cost Analysis Approach

As has been evidenced in the application of the Benefit Cost analysis technique to the problem of assessing the most appropriate means of meeting the future requirements for engineering manpower in Malawi, it is not always possible to implement a straightforward application of the technique. A number of difficulties may be encountered and it

is important that the planner be aware of these.

6.8.2 Capital Rationing

All government ministries and organisations must operate within a stipulated budget, and no matter how many projects are calculated to yield positive returns in accordance with the NPV criterion, the limitation of funds will require that only a few of these projects are implemented. Hence, a situation of "capital rationing" exists.

Capital rationing may occur in a number of different forms; there may simply be a fixed budget to which the planner must conform or there may be 'specific rationing', in which case it is stipulated that the entire budget must be spent in the time period. Alternatively, there exists maximum rationing where the decision maker is restricted to a limited, set budget. Frequently, in long-run projects, the funds are allocated for use on a yearly basis. The problem which arises from a situation of capital rationing, is as Cohn (100;1979) states that "the use of the present value will break down, since it is quite possible that a set of some projects might be chosen which would not maximize social welfare" which is essentially the purpose of the government project. A number of different methods have been proposed by McKean & Hirshleifer (1960) to overcome this problem.

In view of the fact that the optimal decision path in the present Benefit Cost analysis study of Malawi was found to be the construction and expansion of Polytechnic facilities, it is possible that had it not been for the grants obtained (Section 4.5.5.3) to finance such expansion, capital rationing could have posed a serious problem. Due to the availability of the grants however, the issue of capital rationing did not arise in this study.

6.8.3 The Redistribution of Income

The ultimate purpose of almost all government undertakings, is the maximization of social welfare, thereby achieving some measure of redistribution. As has been stated in Section 6.2, the Benefit Cost analysis technique and the calculation of the NPV of each of the

alternative projects, yield information as to which alternative solution is the most appropriate in purely economic efficiency terms. Economic efficiency is clearly not closely aligned to redistributive principles, which frequently stress goals or objectives which are not easily quantified and therefore not included in the Benefit Cost calculations. Such issues do not invalidate the Benefit Cost analysis technique however, for as Dasgupta (89;1980) points out -

> non-economic considerations .... are often difficult to quantify and therefore cannot be easily incorporated into formal measures of net benefits. This has sometimes been used as an argument against formal measures. But the relevance of non-economic considerations makes it more important to measure the economic costs and benefits of a project, not less, for only then can the implications, in any particular instance of project choice, of over-ruling economic considerations be properly understood.

A number of different methods have been proposed for including "social benefit" factors and non-quantifiable costs and benefits into the calculations. The most obvious recommends the calculation of the present value of each project and the presentation of the results with information compiled as to redistribution and social benefit effects. The planner could then make his decision on the basis of these two separate pieces of information.

An alternative approach to the problem is to employ a cost-effectiveness approach to evaluation of all benefits as was employed in the study of engineering manpower in Malawi (Section 6.7.4.1). A benefit rating scale (Section 6.7.4.1, and Appendix E) was employed to assess the otherwise non-quantifiable returns to the alternative projects. It was found that this method permitted some quantification and objective evaluation of non-economic benefits which are particularly important in the provision of education, while also enabling the presentation of solutions to the various projects in the form of a single objective function.

6.8.4 Secondary Effects and Overcounting

It is important for the planner to be aware of the possibility of overcounting the costs and benefits. This is like to occur when "secondary" benefits or costs arise from the implementation of a project are included in the calculations in their full measure.

Cohn (106;1979) emphasises that only the incremental income arising from such "secondary" effects should be included in the calculations.

Steps were undertaken in the current study of Malawian engineering manpower requirements to ensure that overcounting did not occur. This problem was effectively overcome, however, by the separate calculation of the economic costs of the alternatives and the estimation of the benefits or returns by means of a cost-effectiveness analysis and ranking scale, rather than attempting to reduce all aspects to financial returns for calculations in the Benefit Cost framework.

6.8.5 Concluding Remarks on the Limitations of the Benefit Cost Approach

The planner may attempt to take all of the above possible shortfalls of the Benefit Cost analysis technique into account in the application of the technique to the particular problem at hand. However, as Mishan (13;1972) points out, it should be stressed that

> even the result of an ideally conducted Benefit Cost analysis does not, of itself, constitute a prescription for society. Since it stimulates the effects of an ideal price system, the ideal Benefit Cost analysis is also subject to its limitations. Any adopted criterion of a Benefit Cost analysis requires inter alia that all benefits exceed costs, and therefore can be vindicated by a social judgement that an economic rearrangement which can make everyone better off is an economic improvement.

It should be borne in mind that a project which is deemed the most economically feasible, can quite possibly generate considerable inequity for certain groups while offering profits to another group. Before a course of action is decided upon, in line with the social welfare criterion (Section 6.8.3) it is necessary that the resulting distributional changes are not regressive, and no gross inequities are perpetuated.

CONCLUSION

Malawi has, since its independence in 1964, attempted to pursue the developmental objectives of economic independence and increased per capita income. Experience in other LDCs pointed to the fact that human resources and manpower had as significant a role to play in the country's development as the level of capital investment or the exploitation of natural resources. Developmental goals depend, for their successful implementation, on the availability of trained and skilled manpower in many different occupational fields. Consequently, accurate information on the availability of manpower, and in particular, of skilled and educated manpower is an essential precondition of development planning, for ambitious development plans are quite unfeasible without the manpower to implement them.

The availability and quality of trained and skilled manpower is directly related to the provision of educational facilities and opportunities within the nation. However, until fairly recently, the planning and provision of such facilities tended in most of the poor or developing nations, to be a somewhat haphazard affair, frequently being left to local, rather than central government level, and lacking any overall co-ordinated framework.

The increasing realisation that economic planning was not in itself sufficient to bring about rapid, balanced growth and development, was linked with a growing demand by the populations of these nations for educational opportunities. Central governments for these reasons, began to become actively involved in the planning and promotion of educational facilities, but little knowledge was available as to methods and techniques of planning education.

The emphasis on economic planning in Malawi, in the early 1960s did, however, stimulate a rapid growth in the manufacturing industries and initiate intensive agricultural development projects, both of which greatly increased, in the 1970s, the need for manpower trained at high and intermediate skill level. The formulation of Development Policies for the period 1971-1980 provided an economic framework within which projected manpower requirements could be set, and attempts were initiated in 1971 to assess the existing stock of high and intermediate level manpower in Malawi.

The Manpower Survey of 1971 thus revealed, in qualitative and quantitative terms, the existing and projected shortages of manpower at the senior and intermediate skill levels. The most acute skill shortages were found to occur in professions such as engineering, medicine, accountancy etc., which tend to have the highest gestation period. In line with the existing shortages, projected demand for these skills in Malawi was assessed, but a serious deficiency in this Manpower Plan was the failure to establish relationships between manpower demand and educational supply.

A number of formal educational planning techniques exist to assist the planner in assessing the long-run consequences of various educational alternatives, and to identify the right social choices. It must not be forgotten however, that the actual demand for education is private, with the individual consumer assessing the value of education in terms of economic considerations, in addition to social, prestige, and power factors. The problem thus exists for the educational planner in that a dichotomy exists whereby expansion of the educational system must be undertaken in order to meet the national demand for qualified manpower, while pressure also exists to meet the private consumer's demand, which may not necessarily be in line with national manpower requirements. The situation is made more complex in the poor nations by the requirement that rates of return on investment in schooling should be commensurate with investment in human capital.

The situation thus arises whereby two alternatives are open to government in the planning and provision of education. One alternative is to implement loose planning so as to meet private demand, particularly at the higher educational levels, trusting that Say's Law will come into operation - i.e. that supply will create its own demand. Evidence abounds however, particularly in India, that such an approach simply gives rise to growing numbers of 'educated unemployed', while shortages of trained manpower in various occupational categories persist.

A second alternative open to governments as regards the planning of education is to adopt policies controlling the supply of education to the populace, through pricing policies and tax-subsidy measures. The principal planning models available in the assessment and implementation of optimal educational facilities are the Manpower Planning Approach, the Social Demand Approach, the Linear Programming Model and the Benefit Cost Model.

Application of these approaches to educational planning in a number of countries has led to increased reliance on the Manpower Planning approach, and more recently, on the Benefit Cost Analysis framework. The estimation of Manpower shortfalls and projected needs in Malawi were established by means of the application of the Manpower Planning Model. The Manpower Survey of 1971 revealed (24;1980) a serious and growing shortfall in the stock of high and intermediate level skilled manpower required by the nation if developmental goals and objectives were to be pursued:

> The Survey established that the stock of skilled manpower in 1971 was 47,470 persons representing approximately 27% of the total wage employment ... The Survey showed that there were shortages of skilled manpower amounting to under 3% of the employed. However, the projections of future demand showed a rapid widening of this gap to over 20% in 1975, and nearly 35% in 1980.

From 1980, the projected shortages multiplied rapidly and represented great costs to the nation in terms of required economic growth.

Despite the fact that application of the Manpower Planning Approach in Malawi yielded important information and data concerning existing and projected shortages of High and Intermediate level skilled manpower, its application was limited by some serious shortcomings, the most significant of which was the lack of reliable data upon which to base the manpower forecast. Moreover, although shortages in various occupational categories were estimated, the technique did not extend to an assessment of the means whereby such shortages could be overcome.

It was thus proposed that Benefit Cost analysis be applied to the problem of educational planning in Malawi, in an attempt to overcome some of the deficiencies experienced in the Manpower Planning Approach. It was found however, that in the application of the Benefit Cost technique, many of the problems experienced in the Manpower Planning approach posed similar difficulties. Most notable was the lack of available statistical data. Moreover, little agreement was obtained over how uncertainty and risk could be handled, or as to which benefits should be included in the explicit calculations.

Application of Benefit Cost analysis was more easily implemented in the case of evaluation of the costs involved in training manpower in various occupational categories. The evaluation of the benefits to be derived from the

various alternative solutions however, were in most instances found not to be amenable to quantification or evaluation in monetary terms, and consequently the assessment of the benefirs was undertaken by means of a Cost Effectiveness Analysis. This was not to invalidate the importance of the Benefit Cost technique. Its value as a tool of educational planning is found to lie essentially in the degree of flexibility it permits in the planning of future ways of overcoming manpower shortages, in addition to the emphasis it places on the links between school output and manpower resources.

Hence, as Barsby (21;1972) points out, although most planners would not advocate altering the activities of a programme or changing programme priorities on the basis of the Benefit Cost ratio alone, the uncertainties involved in the answers provided by means of the analysis need not prevent Benefit Cost from contributing effectively to decision-making. Indeed, it is proposed, as is evidenced in the case of educational planning in Malawi, that the different manpower planning approaches are in fact complementary techniques, rather than competitive techniques, which is how they are frequently presented. As Blaug (468;1976) states:

> Social demand projections, Manpower forecasting, Rates of Return Analysis (Benefit Cost analysis), are reconcilable, and in fact complementary techniques of educational planning, but not as these approaches are presently conceived... Above all, they must be combined with specific educational reforms and an active manpower policy designed to minimize the burden of administrative planning decisions.

Hence, the important role of Benefit Cost analysis was concluded to lie in the internal analysis of alternative solutions to a problem, rather than in a direct comparison between major educational development programmes, a function which could be effectively undertaken by the Manpower Planning Approach. It was thus determined that while the value of the Manpower Planning Approach lay in its estimation of future demands for manpower in the various occupational categories, the Benefit Cost analysis evaluated the means whereby such demands might be met. As such, the techniques are complementary components to the Educational Planning process.

APPENDIX A

Benefits and Costs Associated with Alternative Solutions to Overcoming the Projected Shortages in Engineering Manpower in Malawi.

A.1 INTRODUCTION

The breakdown of costs for the various alternative solutions devised in accordance with the decision path outlined in Figures 6.4, are assessed and calculated. The various decision paths included in Appendices B, C, and D are as follows:

Alternative 1:

The Malawi Government may act to recruit more expatriate personnel trained at professional engineer level, diplomate and technician level from abroad.

Alternative 2:

The Malawi Government may act to recruit and financially provide for students receiving training in engineering skills at degree, diplomate and technician level at educational institutions abroad. This constitutes out-of-country training.

Alternative 3:

The government of Malawi may alternatively act to meet demand for trained engineering manpower by undertaking to meet projected demands for engineering manpower at degree, diplomate and technician level through the expansion of local tertiary education facilities, notably the Polytechnic.

In the present study, attention was focused on the most critical shortage of manpower experienced in Malawi since 1976, notably the shortage of engineering manpower, trained at technician, diplomate and degree level.

The number of professional engineers, diplomates and technicians who would need to receive training has been taken to be 400, 900 and 2000 respectively, in line with the projected demands for 1988. These projected demands for engineering manpower are reflected in Tables 6.2, 6.3 and 6.4 respectively. It is realised that the figures representing demand are conservative estimates in view of the purported conservative nature of the estimates on which such figures were based. (Section 6.7.1).

The breakdown of the costs associated with each possible alternative are outlined in Appendices B, C, and D. The costs involved in the training or recruitment of engineering personnel, have in all instances been calculated on the basis of cost figures obtained from both government and private organisations in Malawi. (Section 6.7.1).

1978 was taken as the base year for the calculation of the Benefit Cost ratio of each alternative course of action, as consideration of the means by which to overcome the serious shortfalls experienced in the supply of trained manpower first received serious consideration at this time. Consequently, in the estimation of costs associated with each alternative course of action, the costs were discounted to 1978 values.

The benefits associated with each possible alternative course of action are listed and ranked in Appendix E.

A.2 RESULTS OF THE BENEFIT COST ANALYSIS:

A.2.1 ALTERNATIVE 1:

Recruit skilled and trained expatriate personnel to meet the projected manpower demands at technician, diplomate and professional engineer levels.

COSTS:

			Malawi Kwacha
Recruitment of	1000	technicians	45399568,4
Recruitment of	900	diplomate engineers	40859612,4
Recruitment of	400	professional engineers	36439689,3
		TOTAL:	122698870,1

BENEFITS:

As per Appendix E 122

BENEFIT COST RATIO = 1: 1 005 728,44

A.2.2 ALTERNATIVE 2:

Select Malawian students to undergo engineering training abroad at technician diplomate and professional engineering levels.

COSTS:

			Malawi Kwacha
Recruitment of	1000	technician students	13 749 889, 2
Recruitment of	900	diplomate engineer students	22 274 840, 8
Recruitment of	400	professional engineer students	18 949 814, 8
		TOTAL	54 974 544, 9

BENEFITS:

As per Appendix E 90

BENEFIT COST RATIO = 1:610 828, 27

A.2.3 ALTERNATIVE 3

Expansion of local tertiary educational facilities (i.e. the Polytechnic) to meet projected engineering manpower demands.

COSTS:

			Malawi Kwacha
Training of	2000	technician students	6 399 700, 4
Training of	900	diplomate students	2 879 960, 3
Training of	400	professional engineering students	1 680 124, 1
		TOTAL:	10 959 784

BENEFITS

As per Appendix E 132

BENEFIT COST RATIO = 1:83 028,67

A.3 CONCLUSIONS:

Hence, from an assessment and comparison of the Benefits and Costs associated with each alternative solution to the problem of meeting engineering manpower demands to 1988, it is concluded that Alternative 3, the expansion of the Malawi tertiary educational facilities, should be undertaken. This alternative reflects the lowest costs and highest benefits of the three alternative possible solutions.

However, as was discussed in Section 6.9, the results obtained by way of a Benefit cost analysis should not be taken as the basis for policy decisions alone, although the results are clearly of great import in the decision-making process. With regard to the current Benefit Cost analysis, account would also have to be taken of factors such as the future payments of AID to assist in the ongoing implementation of the project. The possibilities of increasing inflation, migration and immigration, co-operative relations with neighbouring states, etc. all would clearly have some import on future policy decisions. However, in view of the OTIS report findings (Section 6.7.1) and the estimation that even if Malawi's data was 100% inaccurate, a shortage of engineering skills was still likely to occur, these factors were not taken to have any overriding significance in the present study.

A further important factor warranting consideration is the fact that the continuing expansion of secondary school facilities would need continuing review and consideration, as the expansion of tertiary education facilities is of little effect if sufficient numbers of adequately prepared students are not available to fill the student places provided by way of such expansion.

Another factor which could have received attention in the application of the Benefit Cost analysis to the assessment of the alternative solutions to meeting projected engineering manpower demand, is the probability of loss of such trained manpower through "brain drain" or migration from Malawi, and also as regards the loss of trained manpower from governmental organisations and concerns to private industry.

In the current Benefit Cost analysis, the probability of loss of manpower trained either at the Polytechnic or abroad is exceedingly low.

Although no official statistics exist in this regard, it is reported (AID/AFR;11;1980) that in the last decade, as few as three trained Malawians have been lost to the country through migration. These figures would appear to reflect in part the high degree of nationalism which exists in the nation, but are also the result of stringent selection and monitoring measures by the government. In view of the low numbers of trained manpower lost through brain drain, etc., the present study did not take account of the probability of loss of engineering manpower through such factors. As was mentioned in Section 6.6.4, attrition or "wastage" factors were also considered negligible due to the skewing of the population curve to the lower age groups.

The present Benefit Cost analysis could, however, have been extended further to assess the costs to the Government of Malawi of the loss of trained engineering manpower to the private sector, had sufficient data been available. At present, it is reported (Section 6.6.4) that the Government ministries lose up to 30% of their trained manpower to private industries each year. The data used in the present Benefit Cost study however, represented both public and private industries (Section 6.7.1) and hence no such estimation could be made.

The Benefit Cost analysis as applied in this instance evidences some limitations in that it provides no means of assessing whether a combination of the various alternative solutions would not in the short term, meet the demands for engineering manpower in a more effective and less costly manner. It is however, proposed that the outcomes of the present Benefit Cost analysis represent fairly realistic guidelines to policy making in view of the large AID grants which are made available. In the application of the technique to other educational policy decisions, it is clear that an assessment of the outcomes of a combination of alternative solutions be taken into consideration.

Hence, it is concluded, that although the Benefit Cost analysis provides policy guidelines, it is insufficient alone for decision-making; social, political and other external factors must also be considered. The approach does though provide a flexible guideline to policy making, and where the Manpower Planning approach provided information regarding the

demand for manpower in various occupational sectors, the Benefit Cost analysis draws attention to the supply factors - how the demand is to be met, and which is the most effective means of meeting the demand. The complementary nature of the educational planning approaches is thus evidenced.

APPENDIX B

Alternative Solution 1

The Costs Associated with the Recruitment of Trained and Skilled Expatriate Personnel from Abroad.

B.1 INTRODUCTION

The recruitment of expatriate personnel to meet the demand for engineering manpower has in the past been undertaken in Britain and this is reflected in the cost estimates calculated below. The costs incurred in the recruitment of expatriate labour are based on the assumption that the recruit has a wife and one child, and that housing would be provided at subsidized rates. Benefits such as pension funds and medical aid are not reflected in the cost estimates due to the contract type nature of the engagement.

B.2.1 Costs Incurred in the Recruitment of Trained and Skilled Engineering Technicians from abroad.

	Malawi Kwacha
- Recruiter's airfare to Britain	2 400
- Recruiter's hotel bill in Britain (5 days at K100/day)	500
- Advertising expenses	1 000
- Recruit and family's airfare to Malawi	5 200
- Settling-in allowance	2 000
- Subsidization of partly furnished housing in Malawi for two-year contract period (K1200/month)	28 800
- Shipment of recruit's belongings to and from Malawi for contract period.	5 500
TOTAL :	MK 45 400

B.2.2 Costs : Recruit Expatriate Technicians

Year	Cost per Recruit	No. of Recruits	Cost in Malawi Kwacha for 100 recruits p.a.	P.V. Factor	Present Value
1978	45 400	100	4 540 000	1	4 540 000
1979	52 210	100	5 221 000	0,870	4 542 270
1980	60 041,5	100	6 004 150	0,756	4 539 137,4
1981	69 047,7	100	6 904 770	0,658	4 543 338,6
1982	79 404,9	100	7 940 490	0,572	4 541 960,2
1983	91 315,6	100	9 131 560	0,497	4,538 385,3
1984	105 012,9	100	10 501 290	0,432	4 536 557,2
1985	120 764,8	100	12 076 480	0,376	4 540 756,4
1986	138 879,5	100	13 887 950	0,327	4 541 359,6
1987	159 711,4	100	15 971 140	0,284	4 535 803,7
				MK	45 399 568,4

Inflation Rate = 15% per annum

Therefore, the total cost of recruiting 1000 engineers trained to technician level from abroad, between the periods 1977 (end) and 1988 (beginning) is Mk 45 399 568,4.

The cost of meeting demands for technician skills by 1088 is based on meeting 50% of the actual demand (i.e. 1000 technicians). In view of the excessively high demand for engineering technicians, and the existence of some training facilities in Malawi, it was estimated that approximately one-half the demand could be met through local training. Hence, the calculations reflect the cost of meeting 50% of estimated demand.

B.3.1 Costs Incurred in the Recruitment of Skilled and Trained Engineering Diplomates

	Malawi Kwacha
- Recruiter's airfare to Britain	2 400
- Recruiter's hotel bill in Britain (5 days at K100/day)	500
- Advertising expenses	1 000
- Recruit and family's airfare to Malawi	5 200
- Settling-in allowance	2 000
- Subsidization of partly furnished house in Malawi for recruit for two-year contract period (MK1200/month)	28 800
- Shipment of recruit's belongings to and from Malawi for contract period	5 500
TOTAL:	MK 45 400

B.3.2 Costs : Recruit Expatriate Diplomate Engineers

Year	Cost Per Recruit	No. of Recruits	Cost in Malawi Kwacha for 90 Recruits p.a.	P.V. Factor	Present Value
1978	45 400	90	4 086 000	1	4 086 000
1979	52 210	90	4 698 900	0,870	4 088 043
1980	60 041,5	90	5 403 735	0,756	4 085 223,6
1981	69,047,7	90	6 214 293	0,658	4 089 004,7
1982	79,404,9	90	7 146 441	0,572	4 087 764,2
1983	91 315,6	90	8 218 404	0,497	4 084 546,7
1984	105 012,9	90	9 451 161	0,432	4 082 901,5
1985	120 764,8	90	10 868 32	0,376	4 086 680,8
1986	138 879,5	90	12 499 155	0,327	4 087 223,6
1987	159 711,4	90	14 374 026	0,284	4 082 223,3
				MK	40 859 612,4

Inflation Rate = 15% per annum

Therefore, total cost of recruiting 900 expatriate diplomate engineers from abroad, between 1977 (end) and 1978 (beginning) = MK 408 596 12,4. This is calculated to meet the estimated demand for 879 diplomate engineers in 1988 (Table 6.3).

B.4.1 Costs Incurred in the Recruitment of Skilled and Trained Expatriate Professional Engineers

		Malawi Kwacha
- Recruiter's airfare to Britain		2 400
- Recruiter's hotel bill in Britain (5 days at MK100/day)		500
- Advertising expenses		1 000
- Recruit and family's airfare to Malawi		5 200
- Settling-in allowance		3 000
- Subsidization of furnished house for four-year contract period (MK1500/month)		72 000
- Shipment of recruit's belongings to and from Malawi for contract period		7 000
TOTAL:	MK	91 100

B.4.2 Costs - Recruit Expatriate Professional Engineers

Year	Cost Per Recruit	No. of Recruits	Cost in Malawi Kwacha for 40 Recruits p.a.	P.V. Factor	Present Value
1978	91 100	40	3 644 000	1	3 644 000
1979	104 765	40	4 190 600	0,870	3 645 822
1980	120 479,8	40	4 819 192	0,756	3 643 309,1
1981	138 551,8	40	5 542 072	0,658	3 646 683,3
1982	159 334,6	40	6 373 384	0,572	3 645 575,6
1983	183 234,8	40	7 329 392	0,497	3 642 707,8
1984	210 720	40	8 428 800	0,432	3 641 241,6
1985	242 328	40	9 693 120	0,376	3 644 613,1
1986	278 677,2	40	11 147 088	0,327	3 645 097,7
1987	320 478,8	40	12 819 152	0,284	3 640 639,1
				MK	36 439 689,3

Inflation Rate = 15% per annum

Therefore total cost of recruiting 400 professional engineers from abroad, between 1977 (end) and 1988 (beginning) = MK 36 439 689,3. This is calculated to meet the estimated demand for 408 professional engineers in 1988 (Table 6.2).

APPENDIX B : REFERENCES

Data supplied by:

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APPENDIX C

Alternative Solution 2

Costs Associated with Out-of-Country Training of Engineering Manpower

C.1 INTRODUCTION

Training of Malawi engineering students abroad has in the past been undertaken in Britain and this is reflected in the cost estimates calculated for this alternative. It is possible that more "appropriate" training might be offered in other nations with developmental circumstances similar to those found in Malawi. However, for ease of calculation and estimation of costs, it was assumed that future training would be incurred at the costs associated with British tertiary education levels.

C.2 Costs Associated with the Out-of-Country Training of Technicians

	Malawi Kwacha
- Administrative costs involved in selection of candidates	250
- Airfare to London	1 200
- Cost of course	6 000
- Living expenses (MK400/month)	4 800
- Return Airfare	1 200
- Miscellaneous costs	300
TOTAL:	MK 13 750

C.2.1 Costs : Out-of-Country Training for Technicians

Year	Cost per Student	No. of Students	Costs in Malawi Kwacha for 100 students p.a.	P.V. Factor	Present Value
1978	13 750	100	1 375 000	1	1 375 000
1979	15 812,5	100	1 581 250	0,870	1 375 687,5
1980	18 184,4	100	1 818 440	0,756	1 374 740,6
1981	20 912,1	100	2 091 210	0,658	1 376 016,1
1982	24 048,9	100	2 404 890	0,572	1 375 597,0
1983	27 656,2	100	2 765 620	0,497	1 374 513,1
1984	31 804,6	100	3 180 460	0,432	1 373 958,7
1985	36 575,3	100	3 657 530	0,376	1 375 231,2
1986	42 061,6	100	4 206 160	0,327	1 375 414,3
1987	48 370,8	100	4 837 080	0,284	1 373 730,7
				MK	13 749 889,2

Inflation Rate = 15% per annum

Therefore the total cost of training 1000 technicians abroad between 1977 (end) and 1988 (beginning) = MK 13 749 889,2.

The cost of meeting demands for technician skills by 1988 is based on meeting 50% of the actual demand (i.e. 1000 technicians). In view of the excessively high demand for engineering technicians, and the existence of some training facilities in Malawi, it was estimated that approximately one-half the demand could be met through local training. Hence the calculations reflect the cost of meeting 50% of estimated demand.

C.3 Costs Incurred with Out-of-Country Training of Engineering Diplomates

The cost of training engineering diplomates abroad was calculated, as in Section C.2.1, on the basis of training costs in Britain. The course involved two years of study abroad.

	Malawi Kwacha
- Administrative costs involved in selection of candidates	250
- Airfare to London	1 200
- Cost of two-year course	12 000
- Living expenses (MK400/month)	9 600
- Return Airfare	1 200
- Miscellaneous costs	500
TOTAL: MK	24 750

C.3.1 Costs : Out-of-Country Training of Engineer Diplomates

Year	Cost per Student	No. of Students	Cost in Malawi Kwacha for 90 Students	P.V. Factor	Present Value
1978	24 750	90	2 227 500	1	2 227 500
1979	28 462,5	90	2 561 625	0,870	2 228 613,7
1980	32 731,9	90	2 945 871	0,756	2 227 078,4
1981	37 641,7	90	3 387 753	0,658	2 229 141,4
1982	43 288	90	3 895 920	0,572	2 228 466,2
1983	49 781,2	90	4 480 308	0,497	2 226 713
1984	57 248,4	90	5 152 356	0,432	2 225 817,7
1985	65 835,7	90	5 925 213	0,376	2 227 880
1986	75 711,1	90	6 813 999	0,327	2 228 177,6
1987	87 067,8	90	7 836 102	0,284	2 225 452,9
				MK	22 274 840,9

Inflation Rate = 15% per annum

Therefore total cost of training 900 engineering diplomates abroad between 1977 (end) and 1988 (beginning) = MK 22 274 840,9. This is calculated to meet the estimated demand for 874 diplomates in 1988 (Table 6.3).

C.4 Costs Incurred with the Out-of-Country Training of Professional Engineers at Degree Level

The costs of training professional engineering manpower abroad, was calculated as in Sections C.2 and C.3 on the basis of training costs in Britain. These courses typically involve four years of study with a return trip to Malawi mid-way through the study period.

	Malawi Kwacha
- Administrative Costs incurred in the selection of the candidate	250
- 2 x Airfare to London	2 400
- 2 x Return airfares from London	2 400
- Cost of four-year degree course	22 000
- Living expenses (MK400/month)	19 200
- Miscellaneous costs	1 200
TOTAL: MK	47 450

C.4.1 Costs : Out-of-Country Training for Professional Engineers

Year	Cost per Student	No. of Students	Cost in Malawi Kwacha for 40 Students p.a.	P.V. Factor	Present Value
1978	47 450	40	1 898 000	1	1 898 000
1979	54 567,5	40	2 182 700	0,870	1 898 949
1980	62 752,6	40	2 510 104	0,756	1 897 638,6
1981	72 165,5	40	2 886 620	0,658	1 899 395,9
1982	82 990,3	40	3 319 612	0,572	1 898 818
1983	95 438,8	40	3 817 552	0,497	1 897 323,3
1984	109 754,6	40	4 390 184	0,432	1 896 559
1985	126 217,8	40	5 048 712	0,376	1 898 315,7
1986	145 150,5	40	5 806 020	0,327	1 898 568,5
1987	166 923,1	40	6 676 924	0,284	1 896 246,4
				MK	18 949 814,8

Inflation Rate = 15% per annum

Therefore, total costs of training 400 professional engineers abroad between 1977 (end) and 1988 (beginning) = MK 18 949 814,8.
This is calculated to meet the estimated demand for 408 professional engineers in 1988 (Table 6.2).

APPENDIX C - REFERENCES

Data Supplied by:

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APPENDIX D

Alternative Solution 3

Costs Associated with the Expansion of Tertiary Education Training Facilities in Malawi and training of Engineering Manpwer.

D.1 INTRODUCTION

The costs incurred in the construction and expansion of educational training facilities are detailed below, based on the calculations of the AID Report (AAA/AFR Project Paper 612-0201;5;1980). Considerable amounts of technical assistance are guaranteed through AID channels if this alternative solution is undertaken. Two years construction period was deemed necessary if this option was to be pursued.

Table D.1 : Project Inputs in Expanded Educational Facilities

	Project Expenditures (K000)					
A. I. D	80	81	82	83	84	Total
- Technical Assistance	-	134	560	558	508	1760
- Equipment and Commodities	-	292	-	-	-	292
- Construction (including costs)	938	797	692			2417
- Participant Training	48	256	344	344	388	1280
- Project Evaluation	-	17	-	47	-	64
- Contingency and Inflation	514	514	1041	233	299	2501
SUB-TOTAL	1500	2010	2627	1182	995	8314
Government of Malawi						
- Technical Assistance	-	-	-	500	500	1000
- Construction	400	-	-	-	-	400
- Participant Training	-	-	52	51	51	154
- Projected Recurrent Cost	1012	1366	1821	2404	3147	9750
SUB-TOTAL	1412	1366	1872	2955	3698	11304
TOTAL PROJECT COSTS	2912	3366	4500	4137	4693	19615

(Source: AAA/AFR Project Paper 612-0201;5;1980).

It was estimated, in view of the grant from the AID scheme, that the annual costs to the Government of Malawi of supporting a university or Polytechnic student in Malawi would be MK4 200 and MK3 200 respectively. (AAA/AFR op cit).

AID technical assistance was available to provide the expanded educational facilities with sufficient instructors and teachers with appropriate qualifications. This assistance was possibly to be given in the form of five instructors, trained to differing levels, serving an average of 2.6 years each. The costs associated with the provision of such teaching staff

would be covered by AID grants, at the levels indicated below:

1.	Senior Teacher in Civil Engineering and Management 2 years 11 months	491,458
2.	Senior Teacher in Electrical/Electronic Engineering 2 years 11 months	491,458
3.	Senior Teacher in Electrical/Electronic Engineering 1 year	168,500
4.	Senior Teacher in Mechanical Engineering 2 years 11 months	491,458
5.	Senior Career Councillor 2 years 11 months	491,458
	(Total Time) (12 years 8 months)	
	TOTAL	MK 2 134 332

Recognition must be made in the calculation of the costs for Alternative 3, of the possibility of double counting. On the basis of the statistical information available, there was no way of determining if the recurrent costs included capital repayments. Hence no costing has been done on the capital side. The assumption is thus made that capital costs are included in the annual costs of training students - i.e. in the MK4 200 and MK3 200 training costs.

D.2 Costs - Associated with Training Technicians at the Expanded Polytechnic

Year	Cost per Student	No. of Students	Cost in Malawi Kwacha for Students p.a.	P.V. Factor	Present Value
1978	3 200	100	320 000	1	320 000
1979	3 680	100	368 000	0,870	320 160
1980	4 232	225	952 200	0,756	719 863,2
1981	4 866,8	225	1 095 030	0,658	720 529,7
1982	5 596,8	225	1 259 280	0,572	720 308,2
1983	6 436,3	225	1 448 167,5	0,497	719 739,2
1984	7 401,7	225	1 665 382,5	0,432	719 445,2
1985	8 512,4	225	1 915 200	0,376	720 115,2
1986	9 788,8	225	2 202 480	0,327	720 211
1987	11 257,1	225	2 532 847,5	0,284	719 328,7
				MK	6 399 700,4

Inflation Rate = 15% per annum

1. Until the construction of expanded Polytechnic facilities is undertaken, only 100 students could be accommodated in the classes. After construction was undertaken, intake could be increased to 225 pupils.

2. Such projections are made on the assumption that adequate numbers of suitably trained secondary school leavers are available to fill the training facilities.

D.3 Costs - Associated with Training Diplomate Students at the Expanded Polytechnic

Year	Cost per Student	No. of Students	Cost in Malawi Kwacha for 90 Students	P.V. Factor	Present Value
1978	3 200	90	288 000	1	288 000
1979	3 680	90	331 200	0,870	288 144
1980	4 232	90	380 880	0,756	287 945,3
1981	4 866,8	90	438 012	0,658	288 211,9
1982	5 596,8	90	503 712	0,572	288 123,3
1983	6 436,3	90	579 267	0,497	287 895,7
1984	7 401,7	90	666 153	0,432	287 778,1
1985	8 512	90	766 080	0,376	288 046, 1
1986	9 788,8	90	880 992	0,327	288 084,4
1987	11 257,1	90	1 013 139	0,284	287 731,5
				MK	2 879 960,3

Inflation Rate = 15% per annum

Therefore the total cost of training 900 diplomate engineers between 1977 (end) = MK 2 879 960,3. This is calculated to meet the estimated demand for 874 diplomate engineers in 1988 (Table 6.3).

1. It is estimated that the existing Polytechnic facilities were of sufficient size to accommodate 90 diplomate students per annum. Hence training could be begun as from 1978.

2. These projections are made on the assumption that adequate numbers of suitably trained secondary school leavers are available to fill the training facilities.

D.4 Costs - Associated with the Training Degreed Engineers at the Expanded Polytechnic

Year	Cost per Student	No. of Students	Cost in Malawi Kwacha for 50 students p.a.	P.V. Factor	Present Value
1978				1	
1979				0,870	
1980	4 200	50	210 000	0,756	210 000
1981	4 830	50	241 500	0,658	210 105
1982	5 554,5	50	277 725	0,572	209 960,1
1983	6 387,7	50	319 385	0,497	210 155,3
1984	7 345,9	50	367 295	0,432	210 092,7
1985	8 447,8	50	422 390	0,376	209 927,8
1986	9 715	50	485 750	0,327	209 844
1987	11 172,3	50	558 615	0,284	210 039,2
				MK	1 680 124,1

Inflation Rate = 15% per annum

1. Due to the shortage of facilities and absence of teaching staff, no degree students could be admitted to the Polytechnic prior to 1980, when construction of facilities would have begun, and when teaching staff would have been recruited.

2. These project are made on the assumption that adequate numbers of suitably trained secondary school leavers are available to fill the training facilities.

Therefore, the total cost of training 400 degreed engineers between 1977 (end) and 1988 (beginning) = MK 1 680 124,1. This is calculated to meet the estimated demand for 408 professional engineers in 1988 (Table 6.2).

APPENDIX E

Benefits associated with alternative possible solutions to the problem of meeting demands in 1988 for Engineering manpower.

E.1 BENEFITS AND BENEFIT SCORING PROCEDURE FOR ALTERNATIVE SOLUTIONS

In line with the implementation of the Cost Effective approach to the evaluation of "benefits" to be derived from the alternative solutions open to the planner in this instance, the purported benefits of each alternative were assessed. In an attempt to make the assessment of the benefits as objective as possible, a series of "benefit statements" were compiled concerning each of the alternative solutions, and assessed for relevance by high management personnel involved in recruitment and selection of Engineering manpower in Malawi. The assessment was undertaken by two managers employed in the public sector, and two in the private sector, in order that the effect of possible conflicting viewpoints regarding localisation policies and training principles might be minimised.

A scale of zero to 8 was used by this group of four persons to determine the pertinence of the benefits statements to the various solutions devised to alleviate a future shortage of engineering manpower. The coding of this scale was as follows:

Points allocated to the "Benefits Statements"	Definition of Points
8	"of great benefit"
6	"very beneficial"
4	"beneficial"
2	"of a little benefit"
0	"of no benefit"

The evaluation of the benefits associated with each alternative are listed in Sections E.1.1, E.1.2 and E.1.3.

It should be noted that the evaluation of benefits in this manner cannot be wholly objective. However, in view of the fact that many of the assumed benefits to be derived from each of the alternative solutions cannot be reduced to numerical or statistical data, it was felt that the approach undertaken yielded pertinent information on possible benefits. This approach was thus implemented in accordance with the Cost Effectiveness framework.

E.1.1 Benefits associated with the expansion of the Polytechnic in the training of Engineering manpower at the various skill levels to meet Malawi's projected requirements.

	Benefit Scores			
	A	B	C	D
1. Expanded educational facilities will help the country to meet its manpower needs more efficiently	6	8	8	8
2. Graduates will be attuned to developmental and technological conditions existing in Malawi	4	6	4	4
3. The trained manpower will most likely remain in Malawi and not leave after a "contract" period	8	8	6	8
4. After training, students will have skills equivalent to those possessed by overseas engineering personnel	4	6	4	6
5. After training, the Malawi engineers/ diplomate/technicians will pass on his acquired skills to other engineering personnel in industry or development projects	2	4	6	4
6. Selection of students for training will be in accordance with the industry or nation's requirements.	6	4	6	8
TOTALS	30	36	34	32

$\bar{X}$ = 132

E.1.2 Benefits associated with the Recruitment of Expatriate Engineering Manpower at the various skill levels, to meet Malawi's projected engineering requirements

	Benefit Scores			
	A	B	C	D
1. There is a readily available supply of skilled and trained manpower	6	6	6	8
2. New technological knowledge and abilities will be introduced to the country	6	8	8	8
3. No training costs will be incurred by Malawi in obtaining this skilled manpower	2	4	4	2
4. Selection of recruits will be in accordance with the private industry' and nation's requirements	4	4	6	4
5. The engineering skills will be transferred to Malawians working in related fields.	2	4	4	2
6. The manpower will originate from a large pool of engineering labour, and the recruiter will therefore be able to fit the various man profiles to the various jobs where vacancies exist.	4	6	6	8
TOTALS	24	32	34	32

$\bar{X}$ = 122

E.1.3 Benefits associated with out-of-country training of Malawian students in Engineering skills at the various levels, to meet Malawi's projected engineering manpower requirements

	Benefit Scores			
	A	B	C	D
1. New technological knowledge and skills will be introduced to the country	8	6	6	8
2. The selection of engineering training fields for students can be made on a more flexible basis, and thus require less forward planning	4	0	2	2
3. No construction or recurrent costs will be involved in establishing educational infrastructure in Malawi	0	4	4	2
4. After training, the individual will transfer some of his skills to Malawians working in related fields	4	2	4	2
5. The industries or government agencies will not be involved in the administrative work and costs involved in recruiting expatriate labour	2	4	0	2
6. The trained manpower will be attuned to Malawi's developmental situation and development requirements because of their local origins.	6	4	6	8
TOTALs:	24	20	22	24

$\bar{X} = 90$

APPENDIX E - REFERENCES

Data Supplied by:

A.

B.

C.

D.

APPENDIX F

Net Present Value Tables

F.1 **Present Value of $1 (PVIF)**
$P = S(1 + r)^{-n}$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	12%	14%	15%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909	.893	.877	.870
2	.980	.961	.943	.925	.907	.890	.873	.857	.842	.826	.797	.769	.756
3	.971	.942	.915	.889	.864	.840	.816	.794	.772	.751	.712	.675	.658
4	.961	.924	.889	.855	.823	.792	.763	.735	.708	.683	.636	.592	.573
5	.951	.906	.863	.822	.784	.747	.713	.681	.650	.621	.567	.519	.497
6	.942	.888	.838	.790	.746	.705	.666	.630	.596	.564	.507	.456	.432
7	.933	.871	.813	.760	.711	.665	.623	.583	.547	.513	.452	.400	.376
8	.923	.853	.789	.731	.677	.627	.582	.540	.502	.467	.404	.351	.327
9	.914	.837	.766	.703	.645	.592	.544	.500	.460	.424	.361	.308	.284
10	.905	.820	.744	.676	.614	.558	.508	.463	.422	.386	.322	.270	.247
11	.896	.804	.722	.650	.585	.527	.475	.429	.388	.350	.287	.237	.215
12	.887	.788	.701	.625	.557	.497	.444	.397	.356	.319	.257	.208	.187
13	.879	.773	.681	.601	.530	.469	.415	.368	.326	.290	.229	.182	.163
14	.870	.758	.661	.577	.505	.442	.388	.340	.299	.263	.205	.160	.141
15	.861	.743	.642	.555	.481	.417	.362	.315	.275	.239	.183	.140	.123
16	.853	.728	.623	.534	.458	.394	.339	.292	.252	.218	.163	.123	.107
17	.844	.714	.605	.513	.436	.371	.317	.270	.231	.198	.146	.108	.093
18	.836	.700	.587	.494	.416	.350	.296	.250	.212	.180	.130	.095	.081
19	.828	.686	.570	.475	.396	.331	.276	.232	.194	.164	.116	.083	.070
20	.820	.673	.554	.456	.377	.312	.258	.215	.178	.149	.104	.073	.061
25	.780	.610	.478	.375	.295	.233	.184	.146	.116	.092	.059	.038	.030
30	.742	.552	.412	.308	.231	.174	.131	.099	.075	.057	.033	.020	.015

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